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Diary Dates

JUNE 17

Joint meeting of the BSHP and the Pharmaceutical Society.

The Wellcome Trust has given on permanent loan the Wellcome Historical Medical Collection to the Science Museum, London and there are now 2 galleries devoted to the collection which probably constitutes the largest display of medical history in the world. On June 17 the BSHP committee has arranged, with the helpful co-operation of Dame Margaret Weston, the Science Museum's Director, that the meeting will take place at the Science Museum.

Dr. Brian Bracegirdle will talk on The Wellcome Museum of the History of Medicine and members will then be invited to tour the galleries.

Details concerning times and when to apply for tickets will be published in the pharmaceutical press.

SEPTEMBER 15

British Pharmaceutical Conference. The History of Pharmacy Session will be held during the afternoon at The Pharmaceutical Society's Scottish Department, 36 York Place, Edinburgh.

Members are reminded that Edinburgh is a major tourist and conference centre and those who wish to stay in hotels should book early. Accommodation in halls of residence may be reserved on the Conference Application Form.

NOVEMBER MEETING

There was widespread approval of the lecture given by Dr. W. E. Court (vice-president BSHP) on November 26 when he covered "A History of Counter Prescribing." He traced the way in which counter prescribing had developed from folklore to the apothecaries and finally to present day pharmacy.

An abstract from his paper in included in this *Pharmaceutical Historian*, unfortunately the excellent series of slides cannot be reproduced. Mr. G. Gunthorpe proposed a vote of thanks to the speaker and added some reminiscences of his own experience "behind the counter".

FOUNDATION LECTURE

The Foundation Lectures have always attracted large audiences and the fifth in the series continued to do so. Sir Frank Hartley was described by the president as being a unique pharmacist in many ways but expecially for his dual distinction of being an Honorary Fellow of The Royal College of Physicians *and* an Honorary Fellow of the Royal College of Surgeons. His long connection with the British Pharmacopoeia Commission made it appropriate for him to present the fifth lecture on "Pharmacopoeias (National and International)—Whence and Whither". An abstract from the paper is included in this issue.

Members again enjoyed the hospitality of E. R. Squibb & Sons Ltd., who have sponsored these Foundation Lectures since their inception and have helped to make them unique occasions. Thanks are also due to Mr. R. Marshall and Mr. A. Devis, of the Pharmaceutical Society's headquarters staff who do so much work behind the scenes at all the meetings held at 1 Lambeth High Street.

A RESTORED PHARMACY

The entire fittings of a pharmacy, including a 35 foot long horseshoe mahogany counter, shoprounds and prescription books have been erected at the Sterling-Winthrop Research Centre, Alnwick, Northumberland. They were the interior of the 19th century pharmacy originally established in Alnwick by Robert Swann in 1825 and taken over by J. L. Newbiggin on 1856. The pharmacy fittings have been described as "typical of a late Victorian or early Edwardian pharmacy". The company is to add to the collection as suitable items become available.

CONTEMPORARY NOTES

A note on the history of The Pharmaceutical Society's Library has been included in *The Square Association News Letter* No. 4.

"The Study of the History of Pharmacy in Great Britain" by L. G. Matthews. *Farmaceutisch Tijdschrift Voor Belgie* Summer 1981.

The Savory & Moore Post. A booklet prepared as a memento of the 200th anniversary of The Pharmacy, 56 Abbeygate Street, Bury St. Edmunds, Suffolk. The text was prepared by Noel J. Stowe manager and pharmacist at the premises.

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A History of Counter-Prescribing

By W. E. COURT

As the specialists in the healing arts evolved from the background of a developing society it was apparent that the roles of the physician, the diagnostician and prescriber, and the pharmacist, the preparer and compounder of medicines, could never clearly differentiate.

The spread of education was limited and scientific thought was frequently illogical and unproven.

Thus emerged many differing practitioners in the medical field — witch doctors, voodoo men, wise women, herbalists, traders in drugs, apothecaries and physicians.

Until about 1800 the compounding of medicines and dispensing of physicians' prescriptions was almost exclusively in the hands of the apothecaries. The apothecaries were trained by a long apprenticeship, and prescribed for minor ailments, calling in the physician only when the symptoms appeared grave. Thus, in their counter-prescribing, the apothecaries would sell in open shop formulations derived from old prescriptions or from current pharmacopoeias or formularies e.g. Pharmacopoeia Londonensis. Chemists scarcely existed and the druggists were, in effect, herbalist/grocers.

Certainly the apothecaries had won the right to practise medicine after the Rose case in 1703 but they were only slowly recognised by the physicians and many preferred pharmacy to medicine. Indeed the pharmaceutical apothecaries were in the majority in 1748 and did not really aspire to medical practice.

The blunderbus prescriptions of polypharmacy were not uncommon and often not very effective. Ancient remedies such as Venice Treacle (at least 60 ingredients) and Mithridatum (Confectio Damocritus, at least 46 ingredients) were still available.

The standing of the apothercary was not good; as Adam Smith stated in 1790 "Apothecaries are the physicians of the poor at all times and of the rich when the danger is not very great".

A protection clause

The Apothecaries Act of 1815 included a protection clause for persons in business as Chemists and Druggists, being engaged in the buying, compounding, preparing, dispensing or selling of drugs and medicinal compounds, whether by wholesale or by retail dealing. The Chemists and Druggists had evolved from the dispensary assistants trained in the dispensaries of the College of Physicians and from the druggists, who really preferred selling drugs, together with apothercaries preferring pharmacy to medicine.

Although the Apothecaries Act, 1815, established the rightful position of the Chemists and Druggists as preparers and dispensers of medicines, they were at the same time legally prevented from diagnosing symptoms and prescribing remedies and would not be able to emulate the Apothecaries and establish the right to practice medicine by custom and long usage.

Nevertheless the common folk still visited the apothecary shops and were treated for minor ailments, with the then current formulations e.g.

Misturae Gentianae Composita Lond. Ph. 1836;
Mistura Cathartica Gray's Supplement, 1848.

Abstract of a paper presented to a joint meeting of The British Society for the History of Pharmacy and The Pharmaceutical Society of Great Britain on November 36, 1981.

As a result of the formation of the Pharmaceutical Society of Great Britain in 1841, the profession of pharmacy became more clearly identified and apothecaries were forced to align themselves to either medicine or pharmacy. Some, under the provisions of the Medical Act, 1958, registered as medical practitioners. Others, including Charles James Payne, first Vice-President of the Pharmaceutical Society, preferred to be pharmacists and their tradition of counter-prescribing for minor ailments continued in normal pharmacy practice.

To aid the counter-prescribing pharmacist, many reference books were available including:

Gray's Supplement to the Pharmacopoeia (1818) and subsequently by Theophilus Redwood (1848),

The Prescriber's Complete Handbook by M. Trousseau and M. Reveil (1952).

Squire's Companion to the British Pharmacopoeia (1864 and 19 editions up to 1925),

Handbook of Materia Medica, Pharmacy and Therapeutics by Samuel O. L. Potter (1886).

Minor Ailments by A Medical Practitioner published by the British and Colonial Druggist (1892),

The Book of Prescriptions by E. W. Lucas (8th ed. 1905, 10th ed. 1915), and

Diseases and Remedies; a concise survey of the most modern methods of medicine publ. Chemist and Druggist (1st ed. 1898; 5th ed. 1916).

The *Chemist and Druggist* from 1859 onwards provided good sources of information under the headings: Practical Notes and Formulae; Miscellaneous Inquiries; Dispensing Notes, and published many formulae and prescriptions for use in shops. Likewise the *Pharmaceutical Journal* offered advice and example.

Typical examples of counter-prescribing formulae of the day included: Cough mixtures comprising liquorice (demulcent and expectorant), opium (analgesic, antispasmodic, diaphoretic), camphor (mild expectorant) and Squill (mildly irritant and therefore expectorant) (1887); For alcoholism, a mixture of cinchona (bitter stomachic and astringent), capsicum (carminative) and aromatic spirit of ammonia (restorative action stimulating respiration, accelerating the heart and causing some vascoconstruction) (1892); Asthma Powders containing stramonium (relieves spasm of the bronchioles), anise (carminative and mildly expectorant) and potassium nitrate (assists combustion) (1892); Gout Mixture comprising colchicum (relief of pain and inflammation), potassium citrate (mild diuretic rendering the urine alkaline) and peppermint water (carminative and antiseptic) (1892).

Logical approach

Such formulations which treat symptoms rather than causes demonstrate a logical approach based on experience.

The legal position of counter-prescribing was clear. There must be no diagnosis by examination of the patient but control of medicines was in its infancy. Poisoning, accidental and deliberate was a problem of the 19th century and the Arsenic Act, 1851 was introduced to curb the use of arsenic particularly as one third of all poisoning cases were due to arsenic administration. Further poisons control was introduced in the Pharmacy Act, 1868, an Act which established the association of the profession of pharmacy with poisons distribution. The Act listed 15 substances or group headings in two sections, the second section being subject to less strict requirements but including Belladonna and its preparations and Opium and all the preparations of Opium or Poppies. As far as dispensing was concerned it was only necessary to label medicines containing

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such poisons with the name and address of the vendor and to record details of the ingredients and the name of the customer in a Prescription Book reserved for prescriptions containing poisons. Dispensing was loosely defined until the Pharmacy and Poisons Act of 1933.

Prior to the advent of the National Health Insurance Act, 1911, the public would often obtain medicines either as patent medicines, chemists' nostrums or individually prepared counter-prescriptions. Thus the chemists and druggists (from 1908, pharmacists) provided a valuable service to ordinary members of the public.

Diseases and Remedies published by the *Chemist and Druggist* stated "It is of the utmost importance that chemists and druggists should be acquainted with diseases as well as with remedies and that they would fail to occupy the position which they are often called upon to hold in their relation to the public and as an intermediary between them and the medical man, unless they have an intelligent acquaintance not only with medicine but also with the cases in which it is used. With regard to the vexed question of counter-prescribing, it may be said, first, that there is counter-prescribing and counter-prescribing—that there is an illegitimate form of it which should never be practised, and which it is believed that those who do practice it know to be illegitimate, but that there is another form which is not only legitimate but necessary and inevitable, and which is conducive to the best interests of all concerned. But it may also be affirmed with confidence that the more the pharmacist knows of disease, of its symptoms and issues, the less eager will he be to assume lightly the functions of the medical man.'

To the practising pharmacist published texts included *Martindale's Extra Pharmacopoeia* (1883 onwards), local formularies and the NHI formularies also offered a range of reasonable and tried prescriptions for the counter-prescriber and many learned the art by watching (and noting down) the favourite recipes of their apprentice masters.

Popular formulae

Formulae such as Mist. Cretae c. Opio with its chalk, opium and tannin astringent catechu and Mist. Ferri Aperiens containing laxative magnesium sulphate tonic and laxative ferrous sulphate and the antiseptic and astringent action of dilute sulphuric acid were well established.

Less drastic was the laxative for young children with senna and tamarind, purgative anthracene glycosides coupled with the tartaric acid and potassium acid tartrate of the tamarind's saline purge and added to the gentle laxative effect of the hexahydric alcohol mannitol.

Eyebrows may be raised on seeing a sciatica draught containing cannabis and phenazone yet the cerebral sedative effect of the cannabis complemented by the analgesic and antipyretic action of phenazone indicated efficacy despite present-day reservations concerning both drugs.

When chilblains are troublesome the 1916 recipe is logical—Belladonna Liniment as a counter-irritant, Friar's Balsam as an antiseptic and protective, Soap Liniment as a mild counter-irritant and Chloroform, analgesic, counter-irritant, rubefacient and solvent.

The restriction of all dispensing to registered pharmacists had long been the aim of the Pharmaceutical Society and it is ironic therefore that the major step towards this goal was achieved, not by pharmaceutical legislation, but by the National Health Insurance Act, 1911. Nevertheless it did recognise that the pharmacist had the skill and knowledge produced by experience and adequate education, not only to safeguard the distribution of poisons but also to dispense the nation's medicines. Particularly in working class areas, the volume of dispensing increased rapidly but counter-prescribing was still important.

Between the two world wars the pharmacist enjoyed a period when, for the enterprising practitioner, the counter-prescribing of mainly vegetable and inorganic drugs and the manufacture and sale of his particular nostrums—cough mixtures, nerve tonics, indigestion mixtures, liniments, corn paints, etc.—offered a good return and satisfied his clientele.

However, changes were on hand. Although the Poisons and Pharmacy Act, 1908, had extended the schedules of poisons, the major change was embodied in the Pharmacy and Poisons Act (1933) and its attendant Poisons Lists. The Dangerous Drugs Act and consequent legislation commenced in 1920 and such legal enactments and their subsequent amendments placed more restrictions on the practising pharmacist.

In addition the practice of medicine itself was changing rapidly. The occurrence of new drugs of proven efficacy e.g. antibiotics, antihistamines, analgesics, etc. and the convenience of new standardised dose forms such as compressed tablets and capsules heralded the decline of the ubiquitous bottle of medicine and changed the patients' expectations.

Fewer opportunities

Expansion of the National Health Service as the requirements of the National Health Service Act, 1946, were implemented resulted in fewer private prescriptions and less counter-prescribing. Nevertheless, the Medicines Act, 1968, recognising a need that has never entirely disappeared, despite area variations, clearly permitted counter-prescribing. No Medicines Licence is required for the preparation or dispensing of a medicinal product for administration to a person when the pharmacist is requested by or on behalf of that person to do so in accordance with the pharmacist's own judgement as to the treatment required and that person is present in the pharmacy at the time of the request. Nor is a Medicine Licence required for preparing a stock of medicinal products for this purpose of counter-prescribing (S.10 (4) Med. Act., 1968).

Where then, is counter-prescribing today? Tried favourites such as Mist. Pot. Brom. et Valerian are frowned upon although Mist. Morph. et Ipecac. remains a good standby and children's mixtures from the B.N.F. serve a useful purpose.

History shows that the pharmacist took over the counter-prescribing role of the apothecary using sensible empirical medicines responsibly. The need arose because the physicians did not wish to be bothered with minor illnesses. Have conditions changed? Busy surgeries encourage the less sick and less persistent to seek the pharmacist's more readily available aid. But the law prohibits examination of the patient so diagnosis is restricted to case history; law also restricts the drugs available due to the provisions of the General Sales Lists, Prescription Only Medicines and Pharmacy Only Medicines Lists.

The early pharmacist learnt his art by long experience and accepted counter-prescribing as part of his professional duty; today's younger pharmacists appear well equipped to discuss advanced allopathic medicine at length but less able to practice counter-prescribing unless distributing good commercially prepared products designed for simple ailments.

If counter-prescribing has a future it depends on the wider education of our new generation of pharmacists and an improved selection of drugs to which they can have access.

A community service

In retrospect, we shall never be able to quantify the psychological value of the loving care bestowed on the compounding of the patient's personal counter-prescribed bottle of medicine but it was personal and it sealed the trust between pharmacist and customer. In the context of their time the apothecary and the pharmacist served the community well because of careful empirical observation.

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1982 Foundation Lecture

Pharmacopoeias—National and International. Whence and Whither?

By Sir Frank Hartley

Modern Pharmacopoeias embody the developments in the physical and biological sciences which enable substances and pharmaceutical and medicinal products to be characterised and identified and their quality to be defined.

Therefore successive editions of pharmacopoeias, especially in this century and increasingly since the Second World War, have reflected the developments in analytical chemistry and in quantitative biological methodologies together with their concomitant demands on statistical aspects of design of experiments and evaluation of measurements. The concept that a pharmacopoeia provided the *presumptive* legal standard for the composition and quality of the materials descibed in it is relatively modern and stems from the operation of Food and Drugs Acts. The 1955 Food and Drugs Act like the 1938 Act provided that: "If a person sells to the prejudice of the purchaser any food or drug which is *not* of the *nature*, or not of the *substance*, or *not* of the *quality* of the food or drug demanded by the purchaser, he shall . . . be guilty of an offence.

The Medicines Act 1968 in Sections 64 and 65 brings the position up to date for medicinal products and for drug substances. Its objectives are concerned with the safety, quality and efficacy of medicines. To that end Section 64 provides that no person shall, to the prejudice of the purchaser, sell any medicinal product which is not of the nature or quality demanded by the purchaser. Section 65 requires compliance of medicinal products when sold or supplied with the standard specified in the appropriate current micrograph.

By concern with constancy of product or purity of ingredients the pharmacopoeia has in fact consistently had relevance to the safety, quality and efficacy of drugs and medicinal products. But it is only with the development of biological and chemical methods of testing that we have been able to extend the concepts of *safety* and the evaluation of *efficacy*.

Subjective methods, and examination of symptoms formerly had to be relied upon to determine the usefulness of drugs and medicinal products. Thus selection was based upon experience and opinion of prescribers and users. And those who prescribed and used had to rely upon the integrity of others to provide assurance of nature, substance and quality.

It was the Medical Act of 1858 which led to the production and publication of the first British Pharmacopoeia. Section 54 of that Act, which established the General Council of Medical Education and Registration of the United Kingdom enacted that:

> "The General Council shall cause to be published under their direction a book containing a list of medicines and compounds and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing such other matter and things related thereto as the General council shall think fit, to be called 'British Pharmacopoeia', and the General Council shall cause to be altered amended and republished such Pharmacopeia as often as they shall deem necessary."

The Medical Act of 1862 dealt more fully with the matter, making plain that the Pharmacopoeia to be published by the Council was to supersede the different pharmacopoeias that had hitherto been in use in England, Scotland and Ireland.

Thus began the British Pharmacopoeia only 120 years ago. The manuscript compiled under the supervision of the Pharmacopoeia Committee was submitted to the whole Council sitting in Committee on May 20, 1862 when an Executive Committee to act in conjunction with the Pharmacopoeia Committee was appointed to carry out the printing and publication of the work. Two sums of £500 were voted to the Committee to defray their expenses and the work was published in 1864, 28,000 copies in all, being printed. But owing to their imperfections more than half of them had to be destroyed and a loss overall of £1,206 was incurred, the cost of the preparation having been £6,229 and the proceeds of sales £5,023.

The preparation of the *Second* British Pharmacopoeia was undertaken in 1864 by A Committee of four members of the General Council.

The Committee enjoyed the services of Mr. Warrington FRS of the Society of Apothecaries and Dr. Theophilus Redwood of the Pharmaceutical Society to do the editorial work of revision under the Committee's direction. The Second British Pharmacopoeia was published in 1867, 40,000 copies in all being issued.

In its preparation many of the published researches which had been reported, at the suggestion of the General Council and of Dr. Attfield, were utilised. An honorarium of £500 was voted by the Council to the members of the Committee. In 1874 an Addendum was published of which 11,040 copies were sold.

The Third British Pharmacopoeia was issued in 1885 having been prepared by similar methods to those followed for the 1864 and 1867 Pharmacopoeias. The work was undertaken by a Committee composed originally of eight members of the General Council with Professors Attfield, Bentley and Redwood as Editors, aided by suggestions and assistance from several of the medical bodies, from medical practitioners and from pharmacists. 44,628 copies of the B.P. 1885 were sold.

An Addendum was published in 1890 containing some 34 articles selected by the Pharmacopoeia Committee of the Council from a list of 140. The several medical authorities had been invited to send in "a list of such new medicines and compounds as possessed or appeared to possess well-recognised medicinal value and which had received the general approval of the medical profession."

The 1885 British Pharmacopoeia appears to be the first one for which a clear policy had been enunciated to determine which new medicines and compounds should be included. Earlier pharmacopoeias had included whatever their compilers thought fit and it is not clear whether this was based on an aggregation of all suggestions made by the Council or Committee members or on a selection made from them. Clearly the ill-fated 1864 British Pharmacopoeia had represented the attempt by the then General Medical Council to reduce to uniformity the several processes and descriptions of the Pharmacopoeias of London, Edinburgh and Dublin. And although these were manifestly compromises made between the differing processes and descriptions of materials included in more than one of them, there is no evidence that other than an aggregation of recognition of the contents of the three was attempted The London, Edinburgh and Dublin Pharmacopoeias had had as their important objectives to secure "purity of drugs". But that then meant defining materials in the appropriate terminology—botanical, zoological, chemical or physical, with a view to such authentication as was then possible with the analytical facilities then available and defining the proportions of ingredients or reactants for making compounds or compounding ingredients into acceptable usable forms.

Safety and effectiveness were matters of observation but could not be measured. Defective drugs were quite common even in the first half of the 19th century. Concern with authenticity and freedom from adulteration so far as vegetable drugs and spices were concerned had depended in the Middle Ages on the "King's Garbeler"—an apothecary named

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Richard Hakedy who was also Warden of the "*Mystery of Grocers.*" He had been appointed to the office by Henry VI to carry out his duties in London, Southampton and Sandwich.

The Aulteration Acts of 1860 and 1872 helped to bring recognition of the need for chemical and microscopical shells as well as medical expertise to the analysis of foods and drugs.

A more critical selection of drugs and preparations to be included in a Pharmacopoeia as well as the evolution of standards and agreed recipes and processes became the basis of the policies which governed the production of the British Pharmacopoeias of 1898 and 1914.

In nine annual reports from 1886 to 1894 Professor Attfield under an arrangement made by the Pharmacopoeia Committee of the General (Medical) Council had submitted abstracts of researches, opinions and other published material, relevant to the process of revision of the Pharmacopoeia.

All this information was drawn upon for the revision which led to the 1898 Pharmacopoeia produced with Professor Attfield acting as editor. He emphasised the need for experimental work and also the consultations beyond the United Kingdom especially with India and with Colonial Authorities about natural drugs and pharmaceutical preparations. The formulae laid down by the British Pharmacopoeia were invariably followed by the Government Medical Stores Department. In consequence an Indian and Colonial Addendum to the B.P. 1898 was published in 1900 and embodied in a Government of India Edition of the British Pharmacopoeia in 1901. It sanctioned recognition of a number of alternative substances and preparations desired for local use including aromatic waters, plaster compositions, liquid extracts with increased alcohol content to prevent fermentation, and higher melting ointment- and suppository-bases.

Censuses of prescriptions were made to derive statistical information about the usage of drugs to assist selection for the 1898 Pharmacopoeia. This scientific rather than authoritarian approach to the compilation of the Pharmacopoeia was continued after the turn of the century and led to the encouragement of criticism and its assessment as well as to experimental work and the evaluation of its relevance.

Studies of the solubilities of chemical substances, of the methodologies for testing for arsenic and lead in medieval substances and preparations, and of ointment bases under different climatic conditions are examples of work by experts that were encouraged by the Pharmacopoeia Committee of the G.M.C. after publication of the B.P. 1898. They led to some of the developments incorporated in the 1914 edition produced under the joint editorship of Professor Tirard, Professor of Medicine, King's College, London, and of Professor H. G. Greenish of the Pharmaceutical Society's School of Pharmacy.

The 1914 B.P. demonstrated the growth of organic chemistry and manufacturing processes by the inclusion of aspirin, Veronal, B-eucaine lactate, diuretin, heroin, chloralamide, trional, etc.

The 1914 British Pharmacopoeia remained official until 1932. In consequence of the shortage of certain materials due to the War however, the Pharmacopoeia Committee of the GMC agreed in July 1917 and in March 1918 to the withdrawal from the 1914 Pharmacopoeia of some medicines and compounds. These notifications were published in the Official Gazettes on the authority of the General Medical Council. The full text of the B.P. 1914 was restored on April 30, 1919 by another Gazette Notice.

Increasingly it had become clear in the preparation of the 1914 B.P. that expertise acknowledge outside the membership of the General Medical Council was required during revision. And so there had been set up by the Pharmacopoeia Committee of the GMC Small Committees of Reference on Chemistry and Botany and on Pharmacy. But although external help was acknowledged the responsibility for the publication was still declared to be that of the General Medical Council in accordance with the Medical Act 1862. The need for according a proper status in relation to the Pharmacopoeia to those authorities external to the GMC who had provided technical expertise and would be needed to continue to do so was examined in 1926 and 1927 by a sub-committee set up by the then Committee on Civil Research. It was chaired by the Rt. Hon. H. P. Macmillan (afterwards Lord Macmillan) and it reported on March 12, 1928.

I have drawn freely on its chapter on the story of the British Pharmacopoeia from 1618 to 1928.

On the basis of the Macmillan Report's recommendations the General Medical Council resolved to appoint a special Commision to be responsible for the British Pharmacopoeia. And that procedure was followed for the appointment of a new Commission after each subsequent edition of the British Pharmacopoeia, until 1970 when the Medicines Act 1968 became operative and thereafter the members of the Commission were appointed by the Secretary of State for Health and Social Services.

The first Pharmacopoeia Commission appointed in November 1928 consisted of Dr. A. P. Beddard as Chairman, Mr. R. R. Bennett, Prof. J. H. Burn, Dr. F. R. Fraser, Prof. J. A. Gunn, Prof. H. G. Greenish, and Mr. T. Tickle, with Dr. C. H. Hampshire, the Chief Pharmacist of University College Hospital as its full-time Secretary.

The new Pharmacopoeia produced by it was completed in July 1932. It was published on September 30, 1932.

But the B.P. 1932 still only included monographs for a selection of drugs and preparations then used in medicine and pharmacy.

Since such selection was based upon reputation and judgement rather than upon objective assessment of value in clinical tests or trials as we know them today, there continued to be usage by prescribers and patients of many drugs and preparations not included in the Pharmacopoeia but for which descriptions and standards either of composition, or based on analysis, were required to safeguard the pharmacist and patient.

The British Pharmaceutical Codex first produced in 1907 (by the Pharmaceutical Society) and revised in 1911 and 1923 to provide a book of reference for those engaged in prescribing and dispensing medicines. Met this need in its 1934 edition and it continued to include standards and formulations of substances and preparations admitted from successive editions of the British Pharmacopoeia in its 1949, 1954, 1959, 1964, 1968 and 1973 editions.

The recognition by the British Pharmacopoeia Commission of the need to verify and validate analytical procedures before adoption led the General Medical Council to set up a laboratory for research on pharmacopoeial problems in November 1933 with Dr. G. R. Page as its first research assistant. And ever since that time successive B.P. Commissions have been aided by the work of its own laboratories. Such work became increasingly relevant and important with the changing therapeutic scene.

Seven addenda were issued to the British Pharmacopoeia 1932, six of them during the Second World War, the seventh becoming official from February 1, 1945. With that Addendum was issued a statement by the General Medical Council on "Approved Names" which it then listed. These had become necessary both to replace proprietary names for drugs no longer capable of being imported from Germany and to avoid the multiplicity of coined non-proprietary names which was then developing.

The declared intention of the B.P. Commission expressed in the 1932 Pharmacopoeia to issue a new Pharmacopoeia every 10 years with a supplement if necessary during that period was frustrated by the Second World War. The revised edition was not published until 1948. Thereafter new editions followed at five yearly intervals 1953, 1958, 1963, 1968 and 1973, with Addenda in the intervals between editions.

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The 1973 British Pharmacopoeia was the first to be published by Her Majesty's Stationery Office and on the recommendation of the Medicines Commission under the Medicines Act 1968. It became H.M.S.O.'s best seller even at what then seemed the high price of £10. Addenda were published in 1975, 1977 and 1978 and the First British Pharmacopoeia (Veterinary) in 1977.

The 1980 British Pharmacopoeia is in two volumes and contains about 2,000 monographs. With its companion volume of Infra-red Reference Spectra it is published by H.M.S.O. at £100 for the set. The turnover now worth well over £1 million.

But the most important innovation in the 1980 British Pharmacopoeia is the inclusion of texts of monographs included in the European Pharmacopoeia of which there are now about 350 in force. The European Pharmacopoeia was developed under a Convention entered into by the original six members of the European Economic Community together with Switzerland and the U.K., in 1964, under the aegis of an Agreement between some of the members of the Council of Europe it was recognised in the Medicines Act 1968.

If there is a monograph in the European Pharmacopoeia it takes precedence over a monograph for that particular product in the British Pharmacopoeia.

Why then still have a British Pharmacopoeia? The answer is that, unfortunately, despite our hopes at the time of drafting the Convention in 1964 and again at the time of enactment of the Medicines Act 1968 the European Pharmacopoeia even after 17 years of growth, is still no more than an embryo. As I have mentioned there are about 350 monographs in the E.P. now in force, compared with about 2,000 in the B.P. 1980.

The relevance of pharmacopoeial standards to international trade has been increasingly understood and collaboration and exchange of information between the U.S.P. and B.P. Commissioners has increasingly helped to diminish incompatibilities between the two pharmacopoeias.

Although there had been international Conferences on drug standards from 1902 when the first one was held in Brussels it was not until 1937 that an effort was made under the Health Organisation of the League of Nations to secure "the unification of pharmacopoeias". Though the work was interrupted by the Second World War it was resumed by an Expert Committee set up by the World Health Organisation of the United Nations in 1947. This led to the publication on the First Volume of the Pharmacopoeia Internationalis in 1951 and of a Second Volume in 1955 with a Supplement in 1959. The Pharmacopoeia Internationalis (Ph.I.) is not intended to be a legal pharmacopoeia in any country unless adopted by the Pharmacopoeial Authority of that country.

While it had seemed at times during the past ten years or so that the evolution of a European Pharmacopoeia might render the continuing evolution of the International Pharmacopoeia redundant, that now seems less likely. The International Pharmacopoeia has become linked with a WHO Certification Scheme on the Quality of Pharmaceutical Products. Moving in International Commerce, and with its Model List of Essential Drugs. It seems therefore increasingly likely to be directed to assisting the development of national programmes concerned with the regulatory control of drug quality in pharmaceutical supply systems.

Pharmacopoeias no longer reflect the prejudices of individuals in the selection of drugs and preparations to be included as a guide to prescribers. They seek to become comprehensive and to provide standards to assist in ensuring the safety, efficacy and quality of all medicines. In that respect they serve and will continue to serve an important social purpose because in contrast to specifications filed by manufacturers with Licensing Authorities they provide demonstrable and checkable evidence of the maintenance of the standards of products reaching the patient or purchaser.

Apothecaries and the development of sea bathing*

By T. D. WHITTET

John Speed

In 1753 John Speed, M.D. of Southampton wrote a book "De Aqua Marina Commentaria" which shows no evidence that he had seen Russell's book.[3] An English version was published in 1786 under the title of "Commentary on Sea Water translated from the Latin of the late John Speed, M.D."[3a]

There were three generations with the name of Dr. John Speed who lived in Southampton.[18] They were descendents of Dr. John Speed, M.D. of London and Oxford who had supplied an adulatory message for "Theatrum Botanicum" published in 1640. This read "To the Worthy Apothecary and Herbarist Master John Parkinson. Io. Speed, Med.D. Oxon.

Although university trained physicians the Speeds evidently practised as apothecaries as, in 1697, John Marsh who had been apprenticed to the apothecary Alexander Alchorne for 7 years from Michaelmas 1693 was called the servant (apprentice) of John Speed, presumably having been turned over to him.[19] This John[2] would be the first of the Southampton Speeds. It is interesting to note that Alchorne's son John was apprenticed in 1632 to Thomas Johnson, the famous apothecary botanist, who revised Gerard's Herbal.[14]

A son of the third Southampton John Speed, Richard, became a well-known chemist of Leadenhall Street and Abchurch Lane where he had a pharmacy at the sign of the Green Dragon. He married the sister of another chemist, John Brown of Old Fish Street who was probably his partner for some time. Two of their sons and one grandson also became chemists and druggists. An account of his interesting family is appended to this paper.

The author of the book on sea water was the third of the Southampton residents. In it he wrote that "as the use of Sea-Water is grown into Fashion I thought it would not be impertinent to make enquiries into its nature, especially as many Patients flock down to Hampshire, I determined to try Experiments on the water that washes the shores of that County."

Speed examined various samples and found that on evaporation 1 lb. yielded about 1 oz. of whitish yellow salts with a bitter taste. He showed that this contained sodium chloride and other salts. He quoted the use of sea water by the ancients and discussed its use in various ailments illustrated by many cases including a woman who drank 25 gallons without suffering any harm.

Although Speed reported Hippocrates as saying that sea water was constipating he also stated that some found it laxative and others cathartic. He advised caution in its use.

John Awsiter

In 1768 another apothecary John Awsiter published a pamphlet "Thoughts on Brighthelmston concerning Sea-bathing and Drinking Sea-Water with some Directions for their use in a Letter to a Friend."[20] He had been bound to Richard Hull on October 4th, 1748 and freed on October 5th, 1756 in which year he was listed at New Street,[21] Westminster and at St. Margaret's Churchyard from 1758 to 1759.

In 1763 he was apothecary at the Royal Naval Hospital, Greenwich and in the same year published "An Essay on the Effects of Opium as a Poison."[22]

*Presented to the British Pharmaceutical Conference, Brighton, 16 September 1981. The first part of this paper was included in *Pharmaceutical Historian* Dec. 1981 Vol II, No. 3.

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In the manuscript notes of the late Dr. Cecil Wall in the archives of the Society of Apothecaries is the following comment about Awsiter: "1768. Founded the first system of baths at Brighton at the pool between the Stein and the sea," whilst Hunt[23] recorded "Sweating and showering baths had been opened at Brighton in 1769 by Dr. Awsiter, who also advised that "sea water mixed with milk made a noble medicine."

Awsiter must have moved to Brighthelmston in either 1768 or 1769 as his address is give in the Society's records as Lambs Conduit Street in 1767 and 1768, as Salisbury Street, Strand in 1769, the year he was promoted to the Livery, and as at Brighthelmstone in 1770.

Awsiter[20] began his pamphlet with "It may be thought that the utility of Bathing in the Sea, and Drinking Sea-Water has been so fully discussed, by several ingenious gentlemen, and particularly Dr. Russell, whose name deserves to be remembered for the lights he has thrown on this subject, nothing new or interesting can be offered on it: But, Sir, I had not been at Brighthelmston above three days, before several particulars presented themselves, which makes a further discussion on Bathing in and Drinking Sea-Water necessary."

He made recommendations for the use of bathing machines and pointed out that it was generally but erroneously believed that bathing is more wholesome in cold weather. He recommended the practice of bathing in warm sea water as well as in cold and stated "The town of Brighthelmston has been much favoured by the countenance of many noble and genteel families, who resort to it every season; in return, every means should be, and I believe is put into practice to accommodate them, more especially those who are so unhappy as to be invalids. —For this purpose I wish to see a set of baths erected.

The building to contain these baths must be near the sea, on account of the water, I would recommend the bathing rooms to be finished in a plain but neat taste, and the baths themselves, respecting shape and size, to be nearly similar to those erected by the Duke of Kingston at Bath.

A building whose whole area is thirty feet, and twelve feet high, will admit of four rooms, with a bath in each, a lobby for servants to wait in, with a space behind them the whole length of the building for the copper, the fuel, and cold bath, which must be kept supplied with fresh sea water pumped out of the sea at half tide. One end of this room may be made also a sweating room, by a proper serpentine disposal of the copper flue; there must be a communication, by pipes, from the copper to the baths, and a like communication from the reservoir, that the baths, by this means, may be attemperated to any degree of heat required."

Presumably the baths Awsiter erected were to this design. He concluded his pamphlet with some comments on the drinking of sea water.

Awsiter apparently did not stay in Brighthelmston for long for the Society's list of 1771 gave no address for him, whilst in those of 1779, 1780 and 1783 it is given as St. John's Antigua.

Awsiter had the degree of Doctor of Medicine but of what university is not known. He also wrote "A Treatise on the Stone Growth and other Disorders arising from Obstruction of the Urinary Passages."[24]

A miniature of him was painted by John Smart, but, unfortunately I have been unable to trace it.[25]

The Royal Sea Bathing Hospital Margate

The Royal Sea Bathing Hospital was a pioneer in the treatment of tuberculosis and was founded in 1791 by Dr. John Coakley Lettsom and several other philanthropists, both medical and lay.[10]

Dr. Lettsom, who had been apprenticed to the well-known apothecary Abraham Sutcliffe of Settle, was an exponent of treatment by sunshine, good air and sea bathing. Margate was probably chosen for the hospital as the town had a good approach from London at a very cheap fare.

The first meeting of the founders was held at the London Coffee House and they included the apothecaries Mr. Adams and Dr. Hawes and the surgeon apothecary John Beaumont.

Adams was Joseph, Jr. who had been bound to his father Joseph Sr. of Basinghall Street and freed on June 1st 1779. He suffered from incipient phthysis which probably attracted him to the scheme. He practised at Walbrook and became a physician in 1796, shortly afterwards going to Madeira to practise. When his health was restored he returned to England and became physician to the Smallpox Hospital and was President of the Medical Society of London succeeding Lettsom in 1815. He wrote extensively on tropical diseases, poisons and on vaccination. He also wrote a life of John Hunter. Adams died in 1818.

Dr. Hawes was William Hawes, an apothecary who attended Oliver Goldsmith in his last illness and was the principal founder of the Royal Humane Society. I described his activities in these matters in 1979.[26]

John Beaumont was a surgeon-apothecary of Villers Street who was also associated with the Royal Humane Society, being its treasurer for some years.

Lettsom explained to the inaugural meeting that he wished to found a sea bathing hospital and had found a site at Margate. At the second meeting held on July 11th, 1791 he reported that he had purchased the site for £300. Its dimensions were 450 by 140 feet. At that meeting Dr. John Latham and William Norris were added to the committee.

John Latham, M.D., F.R.C.P. had published in August of that year "A Plan of a Charitable Institution intended to be established upon the Sea Coast for the accommodation of Persons afflicted with such Diseases as are unusually relieved by Sea Bathing."

Dr. Adams was asked to write to Dr. Kennedy, physician to the Prince of Wales (afterwards George IV), inviting the Prince to become Patron. Adams did so and received the following reply from "The Pavilion, Brighton: I am extremely happy that my application to his Royal Highness for his Patronage of Dr. Latham's Plan has succeeded, as it seems to have given satisfaction to you and him and will doubtless in the end accelerate the progress of the Institution. On the spot where he resides himself (that is Brighton) it is not unlikely but you will make such arrangements as may be necessary for such patients as may prefer Brighton to Margate. You may be assured my endeavours shall not be wanting to give effect to the plan here." Abraham commented "From this it would seem that Dr. Kennedy and the Prince thought that the plan they were supporting was Latham's, and that it was still possible that Brighton might be preferred to Margate.

That, of course was not the case; and Latham in consequence seems to have grown cool in his support. Probably that is why he issued his pamphlet on August 24, 1791, in the hope that as only £5 deposit had been paid, the subscribers might yet withdraw from the Margate scheme, as proposed by Lettsom, and adopt his more elastic plan of having patients boarded out anywhere at the seaside, particularly Brighton or Margate."

William Norris, surgeon to the Charterhouse and the General Dispensary, Aldersgate Street, later became consulting surgeon to the Sea Bathing Infirmary.

The foundation stone of the hospital was laid in 1792 and the original building was planned for 30 beds. It opened in 1796 under the title of the General Sea-Bathing Infirmary. It was renamed the Royal Sea-Bathing Hospital in 1898 and became part of the National Health Service in 1948. It now deals with patients suffering from a variety of orthopaedic and traumatic conditions.

(To be concluded)

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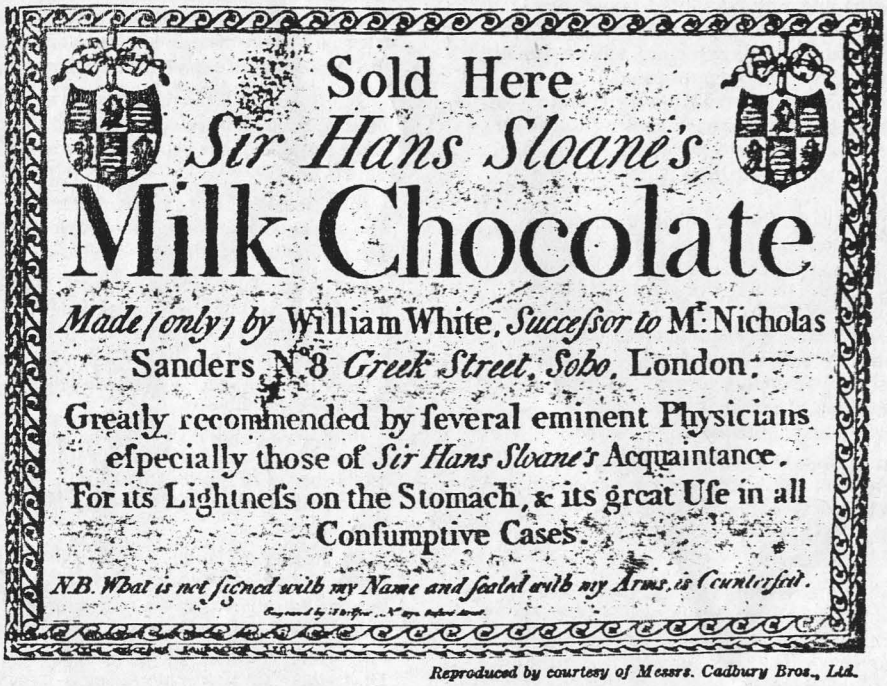
SIR HANS SLOANE as DIETITIAN

In an account of Sir Hans Sloane (1660-1753) and his Collection, written by Jesse M. Sweet and which appeared in the *British Museum Natural History Magazine* of April 1935, No. 34, *V*, pp 61-2 reference is made to him as dietitian. The note reads:

"He was the first man to discover the food value of milk and chocolate and early had his mixture manufactured first by Nicholas Sanders and then by William White of Greek Street, London. The same recipe was made up for many years by Messrs. Cadbury Brothers." The following is reproduced by courtesy of The Trustees of The British Museum.



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Questions and Answers

Members are encouraged to add their comments on the questions or answers for possible inclusion in future issues of *Pharmaceutical Historian*. Please quote reference number — Editor.

8212 Mortars. *Is there any means of distinguishing between mortars made for pharmaceutical use and those for domestic use? Mortars are recorded in Tudor inventories and those of later periods relating to apothecaries and households.*

Where mortars bear the names of known apothecaries or hospitals, e.g. Angibaud or John Battersby (Pepys's friend) there is no difficulty and it may be possible to trace other names from local records. In many cases where two initials appear under a third e.g.

S
A.D.

it is likely that the mortar was given as a wedding present. Perhaps those mortars bearing elaborate bands of decoration, or the reigning monarch's head may have been ordered by apothecaries. It is the plainer mortars that are in doubt.

Comice

Perhaps members of The Society have their own methods of distinguishing and would reply to the query — Editor.

8213 Music Records. *When Prof. John Read was at St. Andrews University he encouraged his students to take an interest in alchemy. One thing the students did was to make a record of the chemical fugues in "Atlanta Fugiens" of the alchemist Michael Maier (1568-1622). Was there a public performance? And is it possible to find out if a record—if made by the students—still exists?*

Please can any member help?—Editor.

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Officers
In accordance with the Constitution and Rules of the Society the Committee has elected the following officers for 1982/83.

President	Dr. W.E. Court
Vice President	Mr. A.G. Mervyn Madge
Joint Secretaries	Dr. W.E. Court
	Mr. A. Wright
Treasurer	Mr. J.C. Bloomfield

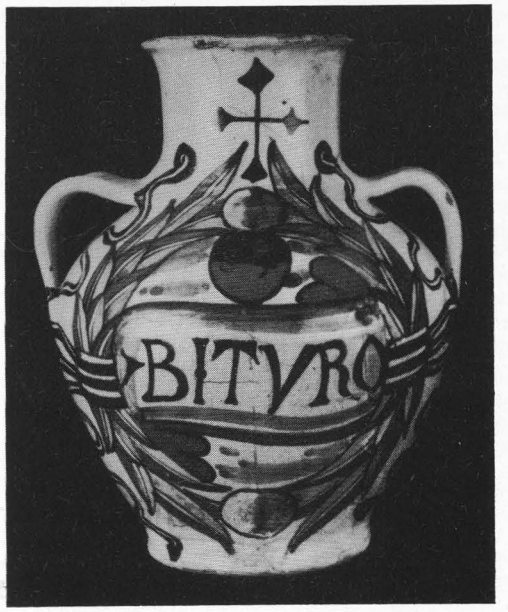
Pharmaceutical Historian
The Committee has gratefully accepted a generous offer by WinPharm (Winthrop Pharmaceuticals) to bear the production costs of this and future issues of the *Pharmaceutical Historian.* The copyright and editorial responsibility still remains with the B.S.H.P. and there will be no editorial involvement or intervention by the company. The Society acknowledges the support and help provided in this arrangement by Bernard Hardisty, Managing Director of the Winthrop Pharmaceuticals Division of Sterling Winthrop Group who, knowing the society's financial problems, initiated the proposal.

NEW BOOKS

The ancient hospital of Santa Fina at San Gimignano in Tuscany is the subject of a scholarly and superbly produced publication entitled *Una Farmacia Preindustriale in Valdelsa : La Spezieria e lo Spedale di Santa Fina nella Città di San Gimignano — Secc. XIV - XVIII.* (Città di San Gimignano, 1981). San Gimignano is a hill town some twenty miles to the north-west of Siena whose mediaeval character has undergone little change over the centuries. The city is of particular interest for a number of houses which embody lofty towers, some crowned by a chapel, and for its cathedral with fine frescoes by Domenico Ghirlandaio and Benozzo Gozzoli.

In the 13th and 14th century no fewer than seven hospitals were founded in San Gimignano to provide for the needs of the sick, to receive foundlings and to shelter pilgrims. In addition one hospital, *Spedale dei Lebbrosi*, was established in 1202 outside the city walls to care for leprous patients. The hospital of Santa Fina was founded in 1253 to commemorate the name of Fina (or Serafina), a paralytic woman of great piety whose life was spent at San Gimignano. Generous donations and legacies permitted the construction of a substantial building accommodating one hundred indigent and sick. In due course the hospital authorities commissioned pottery and glass drug containers of distinction for its pharmacy, and over the centuries a comprehensive range of pharmacopoeias and antidotaria was acquired.

The book under review traces the history of the hospital and gives a detailed account of its possessions. The opening chapter by Giuliano Pinto relates the events from the foundation to the completion of the hospital, quotes *in extenso* the statutes under which the hospital operated, and gives an inventory of the contents of the various rooms in 1495. Guido Vannini discusses the pharmacy and its tin-glazed earthenware drug vessels, some of which bear the emblem of the hospital (the letters S F surmounted by a cross). The collection of glass jars, 92 in number, of great rarity, is described by Luisa Morozzi; the jars were made at glass works at San Gimignano and in the vicinity. Other chapters discuss the medicaments dispensed, the cost of the drugs and results of physico-chemical analysis of the drugs recently carried out by the Faculty of Pharmacy of the University of Siena. The final chapter is given to the role of the hospital during outbreaks of pestilence, particularly the epidemic of 1631 which claimed some two thousand lives.



Drug jar from the Santa Fina Hospital. Height 22cm. The Roundel above the name of the drug is inscribed with the initials 'S F'. The jar was probably made in a Tuscan pottery in the late 16th Century.

The text is complemented by diagrams showing the sources of the drugs and the sites of manufacture of the drug vessels.

The publication, which was issued on the occasion of an exhibition of material from the hospital, is obtainable from the *Comitato di Direzione dei Musei Civici,* Piazza Pecori 1, 53037 San Gimignano; price 12,500 lire (about £5.40), including postage.

R. E. A. Drey

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Some Early Women Research Workers in British Pharmacy 1886 - 1912

By E. J. SHELLARD*

Today, when a young lady walks into a research laboratory ready to start on a research project lasting three or four years in order to obtain a higher degree, no one bats an eyelid. But it was quite different 100 years ago. Women even found it difficult to attend elementary courses of lectures though this was certainly not the fault of the professors at the Society's School of Pharmacy.

Elizabeth Garrett Anderson had attended the lectures given by Professors Atfield and Bentley in 1862 but without the knowledge of the Council of the Pharmaceutical Society, and when she wrote to the Council in September 1872 asking if a group of ladies could attend lectures at the School, the answer was quite definitely 'no'. However, at the meeting of the Council in the following month, that stalwart of women's rights, Mr Hampson, again pursued the request with the result that it was agreed that women could attend the lectures — but not the practical classes — provided they entered the building through a different entrance from that used by the male students. In July 1874 Professor Atfield sought permission from the Council to admit ladies to his practical classes but this was refused and it was several years later before ladies were allowed to attend practical classes at the Society's School. It had also been clearly indicated that women students were not allowed to compete for the School prizes or the Council medals since they were not considered to be "bona fide" pharmacy students. However,the decision in October 1879 to allow Isabella Clarke and Rose Minshull to become members of the Pharmaceutical Society led to changes in attitudes and regulations.

The first woman to benefit from these changes was Margaret Buchanan, for in October 1886, when she passed the Minor examination, she was awarded the School's Certificates of Honour for Botany and Materia Medica. In July 1887 when she passed the Major examination she also obtained the Council's Silver Medal in the Pereira Medal competition.

In the following year, in April 1888, Lucy Boole passed the Major examination and was immediately employed as a research assistant to Professor W. R. Dunstan. She was, therefore, the first woman to undertake research in pharmacy in an organised way in Great Britain. On November 14th 1888, she presented a paper, in conjunction with Professor Dunstan, at an evening meeting of the Society on "Chemical Observations on Tartar Emetic" (Pharm. J. (1889) **19** 385).

She had noted that the assay of Tartar Emetic according to the Pharmacopeia method presented some problems. The Pharmacopeia stated that "29 grains dissolves slowly but without residue in distilled water at 60°F and the solution gives with sulphuretted hydrogen an orange precipitate which when washed and dried at 212°F weighs 15.1 grains."

She observed that unless the solution was acidified some oxysalt was carried down with the sulphide and this, together with free sulphur, would cause the weight to be much higher. Further, acid tartrate of potassium was also precipitated and was difficult to remove unless the total precipitate was washed with an unusually large quantity of water. It was also difficult to filter off the precipitate because it was so finely divided and filtration only became satisfactory if the liquid and precipitate was boiled for some time which led to decomposition of the sulphide. She also claimed that 100°C was not a sufficiently high temperature to remove all the water and finally she noted that the weight of the dried residue should be (as calculated from Sb0 $KC_4H_4O_6$, $\frac{1}{2}H_2O$) not 15.1 grains but 14.67 grains.

Lucy Boole therefore proposed a volumetric method of assay by titrating with n/10 Iodine solution rather than the gravimetric method. She obtained pure Tartar Emetic by recrystallising several times and she checked the purity by determining the potassium as platinochloride after precipitating the antimony as hydroxide. Then she experimented with the volumetric assay before recommending a procedure involving the addition of sodium bicarbonate to the solution of Tartar Emetic and then titrating immediately with n/10 Iodine solution. After using this method to examine 12 samples of Tartar Emetic giving results ranging from 102.3% - 99 or 97% she recommended that anhydrous Tartar Emetic should be used for medicinal purposes. Although the paper came in for considerable criticism from Professor Atfield who defended the pharmacopeial assay, the procedure suggested by Lucy Boole was included in the 1898 British Pharmaceopeia and remained the official method of assay until 1963 when the sodium bicarbonate was replaced by borax. Incidentally in the 1963 Pharmacopeia the demi-hydrate was replaced by the anhydrous sodium/potassium antimony tartrate.

Nothing further is reported of work by Lucy Boole until June 1895 — by which time she was a Fellow of the Institute of Chemistry — when she presented a paper at the Royal Society on "Croton oil: an inquiry into the nature of its vesicating constituent" (Proc. Roy. Soc. (1895), Iviii, 238). She thanked Professor Crossley for his interest but there appears to be no evidence regarding the laboratory where this work was undertaken.

By way of interest it might be recorded that further academic achievements by women pharmacy students were obtained in 1893 (Council Silver Medal by Annie Tilson), in 1899 (Council Silver Medal by Frances Morgan) and in 1902 (Certificates of Honour in the Elementary Courses at the Society's School by Georgina Barltrop, May Burt and Hilda Caws).

In 1902, Elsie S. Hooper, having passed the Minor examination in 1901, passed the Major examination, and was awarded the Redwood Research Scholarship. She was the first woman to be awarded the Redwood Scholarship since its foundation in 1888 and in 1903 she was also the first woman to be given the Burroughs Research Scholarship which had been established in 1898. She worked with H. G. Greenish and in March 1904 should have presented a communication at an evening meeting of the Pharmaceutical Society on "The So-called Beilschmeide Bark (Pharm. J. (1907) **72**, 361). Unfortunately she was ill at the time and the paper was read by Professor Greenish. Elsie Hooper had made a detailed anatomical study of the bark sent by Dr. Dymock to E. M. Holmes as *Beilschmeidea fagifolis* var. Dalzelli — but he was doubtful if it was a Laureaceous bark. She showed quite conclusively that it was not and at the meeting Holmes reported that Solereder had identified it as *Pittosporium floribundum* and this was confirmed by Mr. Holland at Kew. In the Pharmaceutical Journal (Pharm. J. (1902) **74**, 734) there is a note on 'Constituents of Simarouba Bark' by H. E. Greenish and Elsie S. Hooper giving preliminary information and promising a detailed report later but this was never published.

In July and October 1904 she published two communications in the Pharmaceutical Journal on "Exhaustion of Belladonna Root with Alcohol" (Pharm. J. (1904) **73**, 180) and a "Liquid Extract of Cinchonon" (Pharm. J. (1904) **73**, 324). She criticised the existing methods and proposed instead reserve percolation procedures.

While undertaking her research activities and acting as a demonstrator at the School of Pharmacy she studied in the evenings at Birkbeck for her B.Sc. degree in Botany and Chemistry which

*Abstract from a paper given at the Spring Conference, University of Warwick, April 2-4, 1982.

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she obtained in 1905. She also studied for the Associateship of the Institute of Chemistry which she obtained in 1906 and for the Fellowship which she obtained in 1909. After working on the publication of the first British Pharmaceutical Codex she went to work for Professor Huntingdon at Kings College.

In 1910 she joined the staff of the Chemistry Department at Portsmouth Municipal College and was given responsibility for organising a course in pharmaceutical subjects. During the first World War she was an analyst with UCAL, Cheltenham and from 1920 to 1942 she was, first a lecturer, then proprietor of the College of Pharmacy for Ladies in Gordon Square. In 1923, in collaboration with Kathleen King she presented a paper at the meeting of the British Pharmaceutical Conference on "International Standardisation of Colchicum Preparations". She discussed 23 preparations from 12 countries and compared tincture, vinum and acetum, from seed and from corm eventually recommending one preparation only, a tincture prepared from the seed using 70% alcohol. Elsie Hooper was one of the most outstanding women pharmacists — indeed pharmacists — during the first half of this century. She died at the age of 83 on May 6th, 1969.

In 1904 Elsie Hooper was followed as holder of the Redwood Research Scholarship by Norah Renouf who was a native of Jersey, Channel Islands. She passed the Minor examination in October 1902 and the Major examination in April 1903 when she was awarded Certificates of Honour in Botany and in Practical Chemistry. In 1905 she was the first woman to be awarded one of the Salter's Research Fellowships, an honour which was repeated in 1906. She worked with Professor Crossley on the chemistry of camphor derivatives and they jointly presented papers at meetings of the Chemical Society and at an evening meeting of the Pharmaceutical Society. (February 13th 1906).

She did not take the Salter's Fellowship for the third year as she was entitled to do and nothing more seems to have been heard about her with respect to scientific work though she was treasurer of the Association of Women Pharmacists from 1907 till 1916.

The next woman pharmacist that needs to be mentioned is Agnes Thomson Borrowman who was born in 1881 near Melrose in Scotland. She passed the Minor examination in Edinburgh in January 1903 and was then obliged to come to England to find work because of the strong anti-feminist attitudes in Scotland. She worked first at Runcorn and then at Dorking after which she studied at the School of Pharmacy for the Major qualification which she obtained in April 1909. While at Runcorn she investigated the reasons for precipitation in a mixture containing quinine sulphate, solution of arsenious hydrochloride and tincture of ferric perchloride. She found that by using quinine hydrochloride the mixture remained clear and on February 17, 1904 she went back to Edinburgh to present a paper on this at an evening meeting of the North British branch of the Society. (Pharm J. (1904) **72**, 218).

After passing the Major she was appointed a research assistant to Professor Greenish. Actually she found that research work at the Square was not sufficiently financially rewarding and through the good offices of Professor Crossley she took up an appointment as research chemist in the London laboratories of the Rubber Growers Association of Malay and Ceylon.

When her father died in 1913 she was obliged, for financial reasons, to return to retail pharmacy, acquiring the historic pharmacy of Henry Deane at Clapham. But she did not sever her connections with academic pharmacy and she established the College of Pharmacy for Women in Gordon Square. She continued to undertake research in connection with the publication of the British Pharmaceutical Codex and was the first woman to be appointed a member of the Pharmacy sub-committee of the 1934 Codex Reunion Committee. Prior to 1911 she had assisted Edmund White and John Humphrey on a revision of their Pharmacopedia. Agnes Borrowman was the first woman to be appointed to the Society's Board of Examiners when she was made an examiner in Pharmaceutics in 1924, an appointment she retained until her resignation in 1937. She died on August 20, 1955 aged 74.

The first woman to win the Pereira Medal was Gertrude Wren in 1908. She passed the Minor examination in 1907 and the Major examination the following year. In 1906 she had been awarded a Silver Medal in the Society's Herbarium Competition being the first woman to obtain a prize in this competition. Gertrude Wren was awarded the Redwood Research Scholarship in 1908 and was appointed a demonstrator in chemistry at the School of Pharmacy. However, there is no evidence of any publications by her and when she married in 1910 she gave up all her association with pharmacy.

Neither is there any evidence of any research publications by the next woman pharmacist to undertake research work at the School of Pharmacy. This was Grace Neve. She passed the Minor examination in July 1908 when she won the School's Silver Medal and Certificates of Honour for Materia Medica and for Practical Chemistry and in 1909 when she passed the Major examination she won the Silver Medal in the Pereira competition. She was made the Burroughs Research Scholar in September 1909.

In July 1909 Dorothy Braithwaite passed the Minor examination and followed this by passing the Major examination in April 1910. She was appointed a research assistant to Professor Greenish and together they presented a paper at an evening meeting of the Society on November 8 1910 on the Drug Room Beetle (Pharm. J. (1916) **31**, 580). This paper gave a detailed description of the beetle with excellent drawings which formed the basis for its identification when present in powdered drugs. When she left the Square she became a pharmacist at Guy's Hospital in 1912, and was co-author in two research communications to the Pharmaceutical Journal.

Later, Dorothy Braithwaite joined the staff of the Central Checking Bureau for NHI dispensing and was eventually responsible for all the staff engaged in this work by the Retail Pharmacists' Union.

Finally reference must be made to Dorothy Bartlett who passed the Minor examination in July 1910 and the Major examination in April 1911. In 1910 she was awarded a Certificate of Honour in Botany and in 1911 she obtained two School bronze medals for chemistry and for practical chemistry and a Certificate of Honour for pharmacy. In 1910 she was the first recipient of the Hewlett Memorial Exhibition which enabled a student who had passed the Minor to study for the Major without payment of fees. In 1911 she was awarded the Burroughs Research Scholarship and in 1912 this was followed with the Redwood Research Scholarship. She worked with Professor Greenish in the pharmacology research laboratories, chiefly making microscopical examination of powdered drugs in connection with the Committee of Reference in Pharmacy set up by the Pharmacopeial Commission. Together Dorothy Bartlett and H. E. Greenish published papers in the Pharmaceutical Journal.

In 1915 a woman again won the Pereira Medal — Dora Florence White while in the same year another woman — Dorothy Bills — won the Jacob Bell Scholarship for the first time. The Pereira Medal was also won in the following year by a woman, Ella Caird who, on passing the Major examination in April 1915 was awarded the Redwood Research Scholarship. When she passed the Minor examination she gained bronze medals for botany and chemistry and was awarded the Martindale Medal in Pharmacy and the Hewlett Exhibition. In the following year she obtained the School Silver Medals in Botany, Chemistry, Practical Chemistry and Materia Medica. But this takes us into the realms of present day memories and recollections — Mrs. C. E. Corfield is still enjoying life — and her achievements might well be the starting point for research achievements by women pharmacists in a second paper from 1915 onwards.

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The Pharmacopoeia Londinenis 1618 A new Look at an Old Problem.*

By M. P. EARLES

The *Annals* of the London College of Physicians for 1585 refer to the preparation of a pharmacopoeia. Four years later a plan for the work was under discussion. In 1594 a new committee was appointed but shortly after that the project lapsed and was not revived until 1614, the same year that the discussion on the ordinances for a Charter for the apothecaries include a reference to the preparation of a *London Antidotary.* On September 30, 1617 the President, Dr Henry Atkins, announced that the pharmacopoeia was on the point of completion and it was published on May 7, 1618. The volume included a Proclamation by James I dated April 26, 1618 which commanded all apothecaries of the Realme of England to follow the pharmacopoeia. This same proclamation refers to the *Pharmacopoeia Londinensis* as being 'now perfected' but of this there is some doubt, for the following December it was replaced by a new and enlarged version.

There are substantial differences between the two issues of 1618. The May version has two outstanding characteristics; its mild eclecticism (evident in the admission of a small number of Paracelsian or chymical remedies) and its relative simplicity. The number of preparations included was small for the 17th century, and the list of simple drugs was limited to the ingredients of the preparations. The character of the work is emphasised in the preface which refers to an adequate pharmacopoeia, one that is neither mean nor superb, does not lack medicaments but is not crammed with them.

In December the *Catalogus Simplicium* was enlarged to over a thousand items and moved to the front of the book, so that it became a comprehensive catalogue of crude drugs instead of a list of items used in the preparations. There were over two hundred and fifty additions to the formulary and an expansion of the list of generic terms. A transformation had taken place from a simple formulary to a broad exposition of materia medica.

In an epilogue to the December edition the authorities of the College blamed the printer Edward Griffin for the necessity of issuing a new version. He is accused of having taken the manuscript before it was finished. The President is reported to have been indignant to discover on his return to London that it had been published incomplete and full of errors. There is some substance in the accusation. A list of typographical errors occupies a whole page of the May version and the Proclamation was not bound into all the copies. Furthermore the title-page does not reflect the nature of the work or its legal status. Griffin used a standard wood block title compartment which had been used for at least one other work (J. Jewel, *A Sermon Made in Latine in Oxenford,* London, 1609). The December issue made good the errors and gave the book a title page designed by Elstrack incorporating the royal coat of arms and the arms of the College.

There are, however, some aspects of this explanation which are not entirely satisfactory. The errant printer Edward Griffin who printed the May issue (and the December issue, although his name is omitted from the title page) is said to have taken the manuscript before it was finished. We know, however, that on September 30, 1617 the President of the College reported that the pharmacopoeia was on the point of completion. It is indeed remarkable that the printer should have taken a manuscript deficient in hundreds of simples and formulae, and yet produced an organised, structured formulary.

George Urdang who made a careful analysis of the two issues of the pharmacopoeia suggested in his introduction to a facsimile edition of the May issue (Madison, 1944) that the decision to publish the December issue was the result of dissent within the College of Physicians. He was of the opinion, although no supporting evidence was given, that younger members of the College in association with dissatisfied practitioners forced the change. He wrote, "this assumption may find its confirmation and explanation in the change from the Rennaissance to the Baroque spirit which was taking place at the time. Effective display, not immediate practicality, dominated mind and action.....and it is not impossible that [the dissidents] considered the absence of the display of knowledge as an affront to the dignity of the Royal College...."

A difficulty about this explanation is the short time that elapsed between the two issues. Seven months is hardly long enough to raise a debate, force a reversal of decisions and agree on what best reflects the dignity of the College. When these matters were decided there remained the task of compiling, typesetting, printing and binding.

A more prosaic explanation has been advanced by R. S. Roberts. In a lecture to the Pharmaceutical Society of Great Britain in 1969 Roberts pointed out that in 1618 the Court of the Society of Apothecaries prosecuted fifteen apothecaries who were in practice whilst remaining members of the Grocers Company.* The defendants referred to an earlier petition to the King which appealed against restrictions on the trade in apothecary goods and the freedom to belong to a particular company. This petition was then with a Committee of Referees which in the Autumn asked the apothecaries and grocers to draw up a schedule of commodities claimed to be peculiar to their respective trades. Roberts drew attention to the second much enlarged issue of the pharmacopoeia in December and he interpreted this event as an attempt by the College to widen the monopoly on medicines for the apothecaries and so pre-empt the findings of the Committee of Referees.

Here again we have the problem of the time required to compile and print an enlarged work although here the time factor is not so critical as in the case of the Urdang explanation because there is a specific policy giving a clear direction to the compilers. This monopoly argument, however, is weakened by the composition of the new issue. It explains the increase in the number of *Condita* or preserves from 23 to 41 (this is the example given by Roberts) but not the increase in animal faeces (including human faeces) from 2 to 11 and why five urines (including human urine) were added when there were none before. How important was the monopoly of human excrement to the newly fledged Society of Apothecaries?

A feature of the May issue is that it appears to be related more closely to contemporary pharmacotherapy than its successor. For example the prescriptions composed by Sir Theodore Turquet de Mayerne (who was closely associated with the pharmacopoeia) for the mathematician Thomas Harriot in 1615 involve the use of 47 identifiable plants and plant products, 6 animal and animal products and 16 in the class 'metals, salts and chemicals'. Thirteen named compounded remedies were also prescribed.** The shorter May issue of the pharmacopoeia contains 70% of the simples used in the prescriptions and 12 out of the 13 preparations. The inventory of the apothecary Thomas Baskerville of Exeter who died in 1596 includes 136 identifiable simple drugs of which 110 or 81% occur in the May issue of the London Pharmacopoeia.*** This second example agrees with Roberts' assertion that many of the simples in the December issue are not to be found in apothecary inventories.

The character of the May issue in relation to contemporary therapy together with the question of how the new version was produced in seven months suggests an alternative view to the

*Summary of a talk given to the Annual Conference of the British Society for the History of Pharmacy at the University of Warwick, April 4, 1982.

* Reported in the *Pharmaceutical Journal*, 1969, 202, 38-9

** British Library, Sloane Manuscripts 2065, 2085.

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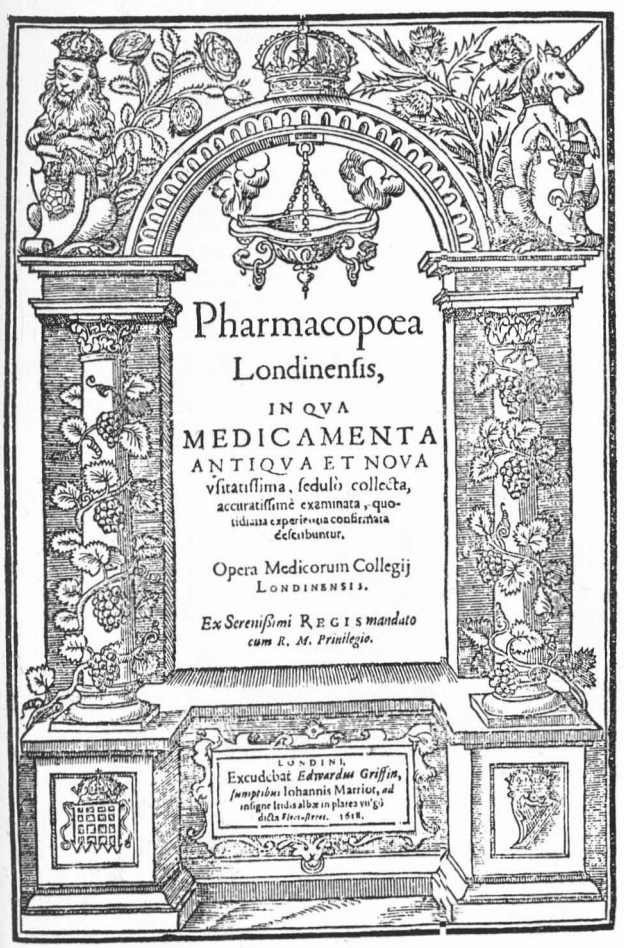
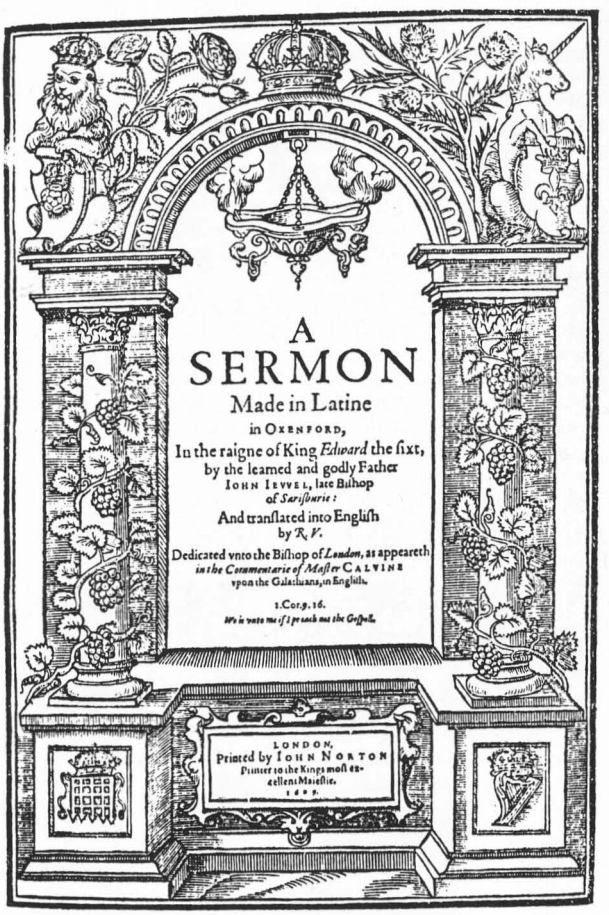
sequence of events in 1617 and 1618. This is that the December issue was not compiled after the May edition as assumed by Urdang and Roberts but was the version originally put together and was the work referred to by the President in September 1617 when he announced the manuscript on the point of completion. Subsequent to this announcement it was decided (by person or persons unknown) to produce a formulary that was more closely related to the prescribing habits of the time. The number of preparations was reduced and the catalogue of simples limited to items appearing in the formulae so that over seventy roots, over one hundred leaves, over twenty animals and well over one hundred animal products (including the excreta) were deleted at a stroke. The result was the modest but adequate formulary implied in the preface to the May volume.

This interpretation of events solves the time problem because it would be easier to make a judicious deletion of items between September 1617 and May 1618 than it would be to convert a relatively simple work into a larger more complex one between May and December 1618. It leaves open the question of why the May version was replaced but this sequence of events modifies to some extent the explanations given above. It confirms the College claim that the May issue was produced from an incomplete manuscript but it was incomplete in the sense that it was an edited version of the larger original. The printer took the blame for the person or persons who adopted the policy for a simplified version of the much heralded formulary. It provides a motive for the disagreement by members of the College as suggested by Urdang. The shorter May version was objected to by members of the College who demanded, to the embarrassment of the officers, the restitution of the original. It is also possible that the original larger version may have been rushed into publication to assist the apothecaries as Roberts has suggested. The new view of the sequence of events, however, implies that if this was the case the monopoly of the apothecaries was established on the basis of a compilation of materia medica that took place over a number of years and was not a hurried trade protection exercise. The most significant conclusion to be drawn, however, is that although the December issue became the first London pharmacopoeia and the basis for the official materia medica until the reforms of the 18th century, the May version must be regarded as the better guide to pharmacotherapy in the early part of the 17th century.

*** See the paper on Thomas Baskerville by M. Rowe and G. E. Trease in *Transactions of the British Society for the History of Pharmacy*, 1970, i, 3-28.





A standard wood block compartment was used for the title of the first issue of the London pharmacopoeia in May 1618. The same compartment was used for a book of sermons in 1609.

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Apothecaries and the development of sea bathing†

By T.D. WHITTET

Some Treatises on Sea Bathing

In 1795 John Anderson,[27] physician of the General Sea-Bathing Hospital wrote "A Practical Essay on the good and bad effects of Sea-Water and Sea-Bathing." He gave a list of conditions in which he had found sea bathing efficacious and quoted the results of several apothecaries and surgeon-apothecaries — Samuel Frome, George Slater, Isaac and John Silver of Margate, Edward Daniel of Ramsgate and Thomas Mantel Power of Broadstairs. John Anderson may well have been the person of that name who was admitted to the Society of Apothecaries by Servitude on Aug. 7th, 1792.[11]

In 1810 A.P. Buchan, M.D.[28] published "A Treatise on Sea-Bathing" in which he quoted the analysis of sea water by "that excellent Chemist Mr. Accum." This was Frederick Christian Accum, (1769-1838) an apprentice of the Brande Pharmacy in Hanover who became an assistant at the Brande Pharmacy in Arlington Street, London. He was a pioneer of analysis and of pure food and drugs.

In conclusion we can thus see that numerous apothecaries were prominent in the development of bathing and made useful contributions to the literature of the subject.

APPENDIX

The Speed Dynasty[18]

The founder of the Speed family of physicians and chemists and druggists was John Speed, Citizen and Merchant Taylor of London, antiquarian and historian, who was born at Farrington, Cheshire in 1552. In 1572 he married Susanna, daughter of Thomas Draper Esq. of London and he died in 1629.

Their elder son John (1)* was born in London in January 1595, educated at Merchant Taylors' School and St. John's College, Oxford, graduating as B.A. in 1616; M.A. in 1620 and M.D. in 1628. He became a Fellow of St. John's and was buried in the Chapel there on his death in 1640.

He married Margaret, daughter of Dr. Bartholomew Warner, M.D., Professor of Physic at St. John's. Their elder son John (2) was born in 1628 and also educated at Merchant Taylors'and St. John's, graduating B.A. in 1647/8, M.A. in 1660 and Doctor of Physic in 1666. He became a Fellow of St. John's in 1644 but was expelled from the University by the Parliamentary Commissioners in 1648, presumably for Royalist sympathies. He was reinstated on the King's restoration in 1660.

He moved to Southampton in about 1667 and became Mayor in 1681/2 and 1693/4. He had become a Freeman of Southampton in January 1658/9. He died in 1711 and was buried at Holy Rood Church.

He was called John Speed the Elder in the British Museum Catalogue which lists a publication by him "Batt upon Batt. A poem upon the parts, patients and paines of Barth (Bath)" 1680, two editions.

His first wife whom he married in 1667 was Elizabeth Bernard (nee Baker) widow of the Rev. Wm. Bernard, Vicar of Holy Rood.

Their only son was John Speed (3) who was baptised at Holy Rood in 1671. He entered St. John's in 1689 but transferred to New College where he graduated in 1697 and became M.D. in 1709. He died in 1747.

He married Anne, daughter of James Crosse, Merchant and Alderman of Southampton, in 1680. Their eldest son John (4) was born in 1703, became M.A. at St. John's, Oxford in 1729 and M.D. in 1740. As well as his book on sea bathing he wrote a Manuscript History of Southampton which is preserved in the Corporation Records. He died in 1781.

The fifth son of John Speed (3); Richard (1) was born in 1711; he was apprenticed to Benjamin Evans of the Grocers' Company.

He became a famous Chemist of Leadenhall Street and Abchurch Lane, London. He received the Freedom of the Borough of Southampton in March 1740/1. He was a Fellow of the Society of Arts and became third Warden of the Grocers' Company in 1748 and first Warden (Master) in 1772.

In 1740 he married Sarah, daughter of John Brown, Gentleman and sister of John Brown "the noted Chemist of Old Fish Street Hill, London."[18] The latter was probably the "Mr. Brown, druggist, of Old Fish Street" at whose laboratory the surgeon Ranby gave an anatomy lesson in 1730. He was an apothecary who had been bound to his father and namesake and freed on September 7 1697.[14] He was listed at that address until 1751.[21]

John and Sarah Speed's eldest son John died in infancy, the second Richard (2) was born in 1742 and the third Thomas in 1743, all in Abchurch Lane. The Grocers' Company Apprenticeship Register records that on July 3, 1758 Richard Speed, son of Richard, Citizen and Grocer, was bound to Henry Banks for 7 years. Richard (2) appears to have forsaken pharmacy as he became a Captain in the East India Company's Service.

The ramifications of the Speed firm are considerable. In 1740 Fludyer and Speed, Druggists were listed in one of the London Directories as in Leadenhall Street.[29] I have been unable to find anything further about Fludyer except that in 1749 Samuel and Thomas Fludyer were listed in Bishopsgate Street without occupation as was Richard Speed of Abchurch Lane.

In 1754 and 1755 the "Complete Guide" listed Richard Speed at Old Fish Street whilst in 1757 and 1753 Speed and Windle, chymists and druggists were at that address. Also in 1763 Mortimer's Universal Directory listed Richard Speed Chemist at Old Fish St. From 1768 to 1772 Speed and Son were at that address but from 1774 to 1781 Richard and Thomas Speed Druggists and Chymists were at 90 Cannon Street.

From 1791 to 1795 only Thomas was listed at that address, the alteration in title presumably occurring after his father's death in 1784. (Directories are not available for every year).

From 1798 to 1803 the firm was called Speed and Usher, reverting to Thomas Speed in 1804, the last year in which it was listed. I have found nothing further about Windle or Usher. The firm may have had several pharmacies as it was listed in Abchurch Lane, Leadenhall Street, Cannon Street and Old Fish Street on various occasions, some of which overlapped.

Thomas Speed, who was apprenticed to his father and became his partner was fourth warden of the Grocers' Company in 1773, second in 1784 and first (Master) in 1785. His only surviving son (name unknown) also became his partner.

The Speeds were an armigerous family.[18] The blazon of the arms granted to the earliest John being "gules, on a chief or, two swifts volant proper. Crest on a wreath or and gules a swift volant proper."

John Speed (2) had a variant: "Party per chevron argent and gules, in chief two swifts on the wing". Later he impaled these with the arms of Philadelphia Knowles his second wife.

ADDENDUM

Mr. L.W. Lauste, F.R.C.S. has told me that he has discovered that the Doctorate of Medicine awarded to John Awsiter was by the University of St. Andrew's.

I have found several other examples of the interest of apothecaries in bathing.

Edward Jorden, M.D. (1569-1632) who wrote "A Discourse of Natural Bathes and Mineral Waters" was probably an apothecary.

†The first part of this paper was included in the *Pharmaceutical Historian* Dec. 1981 Vol. 11 No. 3 and the second in Apl. 1982 Vol. 12 No. 1.

*The medical John Speeds are shown as (1), (2) etc.

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Thomas Johnson, the famous apothecary-botanist who revised Gerard's Herbal, published in 1634 "Thermae Bathonicae" in which he described the thermal baths of the City of Bath, the physical properties of the waters and medicinal uses. It was dedicated to the "Sociis suis iterantibus Societatis Pharmaceuticae, Londinensis." This was a private botanical and herborising club of members of the Society of Apothecaries of London.

Henry Chapman, who published in 1673 "Thermae Redivivae: The City of Bath Described," was called a Gentleman but was almost certainly an apothecary as were several members of that family.

John Underhill, apothecary of Bristol, extolled the virtues of the waters of Bristol Hotwells in "Thermalogica Bristoliensis, published in 1703.

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2d 3rd ed. 1753, as c, plus "To which is added an Epistolatory Dedication to R. Frewin, Oxford.
2e 4th, ed. 1760. As before plus "To which is added a Translation of Dr. Speed's Commentary on Sea-Water. Also an Account of the Nature, Properties and Uses of all the remarkable Mineral Waters of Great Britain and of the Foreign Mineral Waters of Pyrmont, Spa and Seltzer. Revised and Corrected.
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The earliest demonstration of the placental passage of morphine? *

By D. B. JACK and S. J. LAUGHER

In a detailed study, published in 1972, of the maternal and foetal distribution of morphine, Johannesson, Steele and Becker summarise work done in rats during the preceding decade on the distribution of morphine and dihydromorphine.

However, Shute and Davis, in 1933, had administered 15 mg doses of morphine to mothers a few minutes before delivery and had detected morphine in the stools of all the babies for several days following the birth. In fact, concern about the risk to the unborn child, following drug administration to the mother, goes back much further.

In 1885, in Leipzig, Preyer published a comprehensive work entitled "Specielle Physiologie des Embryo" and in it he included a section devoted to the problem of the passage of foreign compounds from maternal blood to the foetus: Übergang von Stoffen aus dem Blute der Mutter in die Frucht. In it Preyer reviewed the work that had been carried out during that century starting with Mayer in 1817 who gave repeated doses of tincture of indigo and saffron to a pregnant rabbit. The animal expired a few hours later and, on dissection, the urine in the bladder was found to be green and the right uterine horn was found to contain four dead embryoes. The stomach and intestines of each foetus contained a green fluid and traces of green were also found in parts of the placenta. Also in 1817 Magendie injected camphor intravenously into a pregnant bitch. The blood had a strong smell of camphor but no such smell was detected in the blood from a foetus removed from the uterus three to four minutes later. However the blood from a foetus removed after fifteen minutes smelt strongly of camphor. In 1858 Schauenstein and Spaeth administered potassium iodide to syphilitic, pregnant women and demonstrated iodide in the meconium and liquor amnii. Flourens in 1860 mixed madder with the food given to a sow during the last forty five days of her pregnancy and observed that the bones and teeth of the litter were red. No other parts were affected.

Much speculation, of course, took place regarding the fate of alkaloids and Preyer speculates on the passage of morphine: "It is controversial whether or not the foetus is poisoned by the giving of chloroform inhalations or morphine injections to women in labour. In such cases it is difficult to come to any conclusion because newborn are prone to sleep a great deal and a greater depth or longer duration of such sleep cannot always be confirmed because of the lack of a suitable comparision. . . . . In one case the

* Taken, in part, from a paper given at the Spring Conference, University of Warwick, April 2-4, 1982.

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(2450 - 546)

administration of intravenous morphine to the mother resulted in bradycardia and arrythmia of the foetal pulse". He concludes: "The opinion entertained by some, that the regular use of morphine and opium may allow the foetus to adapt itself to their toxicity so that it enters the world already narcosed, is all the more likely since, among the opium eating peoples of the world, complete abstinence is observed throughout pregnancy. The supposition that, among such people, the alkaloids of opium do not cross the placenta is highly improbable".

Preyer goes on, however, to cite the animal experiments of Wolter who injected intravenously a number of alkaloids including morphine, veratrine, strychnine and ergotine to pregnant animals and was unable to detect any trace of them in the foetal blood. Preyer suggests that the time between injection and excision of the foetus may have been too short and he also suggests that the failure of a number of the experiments could be explained by the lack of a sufficiently sensitive chemical test for the compounds. It is true that during the early part of the 19th century the demonstration of the placental passage of morphine was hampered by lack of a suitable test but the second half of that century saw the rapid development of a number of tests such as those of Husemann and of Froehde. However, as far as we have been able to discover, it was not until almost the end of the century that the placental passage of morphine was unequivocally demonstrated. This was achieved by Eduard Marquis and published in a thesis in 1896.

Marquis was born in the Baltic port of Riga in 1868. His father, Johann, was a pharmacist and had achieved the title of Provisor which qualified him to prepare and dispense drugs. While Eduard was still young his father moved to the university town of Tartu, called by the Germans, Dorpat. The University of Tartu had been founded by Gustavus Adolphus in the last year of his life when Sweden held sway over much of the Baltic. Marquis began his studies in chemistry at the university in 1888 and, after some changes of course, settled down to the study of pharmacy. He worked as an assistant under the famous German professor Georg Dragendorff and took up the suggestion of Dragendorff's successor, Kobert, that he investigate the fate of morphine in animal tissues. Marquis undertook this work for his Magister degree and developed a highly sensitive test for morphine, which still bears his name.

The Marquis reagent is prepared by adding two drops of 36-40% formaldehyde to 3cc of concentrated sulphuric acid; it produces a red violet colour with morphine and codeine. Testing over 300 other alkaloids, Marquis found that none gave exactly the same colour as morphine and codeine. This reagent was more stable and sensitive than the other reagents then available for the detection of morphine. Using it, Marquis was able to administer 60mg of morphine intravenously to a cat and demonstrate the presence of the drug in the serum, liver, kidney, spleen and other tissues. He also administered morphine to a pregnant cat and detected the drug in the placenta and foetus. For this work Marquis was awarded the degree of Magister of Pharmacy in 1896 and accounts of his researches were published as a thesis entitled Über den Verbleib des Morphins im tierischen Organismus, H. Laakmann's Buch- und Steindruckerei, Jurjew (Dorpat) and in Volume XIV of Kobert's Arbeiten des Pharmakologischen Institutes zu Dorpat. Both accounts appeared in 1896.

As far as we have been able to ascertain, this is the earliest account of the chemical demonstration of the passage of morphine across the placenta, confirming Preyer's opinion some ten years earlier. When Marquis left Tartu he went to St. Petersburg to become a chemist at the Mint. He was still there in 1904 but no information on his subsequent career has been found. The town of Tartu still has an active university which is now in the Estonian Republic of the Soviet Union.

Questions and Answers

Members are encouraged to add their comments on the questions or answers for possible inclusion in future issues of *Pharmaceutical Historian.* Please quote reference number — Editor.

Reply to Pharmaceutical Historian
Vol. 12 No. 1 April 1982 **8212 Mortars.** *Is there any means of distinguishing between mortars made for pharmaceutical use and those for domestic use?*

It is generally impossible to distinguish pharmaceutical from domestic and other mortars, unless indicated by decoration, inscription, material or provenance. A mortar may have a history associating it with pharmacy. Mortars of certain materials, eg. porphyry, glass, lead, were probably made for pharmaceutical or alchemical use. The most important clues come from decorations and inscriptions.

The best English examples were made in bell metal, or bronze. Most are 17th century, and decorated with designs also used on church bells. One symbol used has been interpreted as the alchemical sign for powder.

Inscriptions may include the titles "Apothecary" and "Pharmacopaela", and several apothecaries' names have been identified. Initials may be those of the founder or owner. Triple initials may celebrate a man and his wife (cf. full inscriptions such as 'Henry Mayo c Rebcca His Wif') but can also indicate name and place, as in $S_E T$, for bell and mortar founder Steven Tonne of Edmundsbury.

Size is no indication of pharmaceutical use. Great mortars were made for surgeons, grocers, fishmongers and large households, apart from advertising the apothecary's wealth and position.

A detailed discussion on "Comminution and English Bell Metal Mortars 1300-1850" (Crellin & Hutton) may be found in 'Medical History' XVII 3.7.1973. Work continues on identifying makers and owners of English mortars, and I shall be very pleased to hear of any decorated dated inscribed examples to add to my catalogue.

D. A. Hutton

8214 "Still Drugging?" *In 'The London Perambulator' (London, 1925), James Bone describes many long established London shops. Amongst them (p. 121) he mentions 'A firm of druggists, still drugging, opened a free medicine stall in the Spital Market during the Plague of London in 1665.' Can anyone identify the firm, and say whether it still exists?*

D.A.

8215 Drug Jar Inscriptions *An Italian drug jar. 17th century, bears within a shield the initials A.F.L. Help with identifying the original owner would be appreciated.*

Cantor

8216 Holloway's Ointment Jar *bears an address 533 Oxford Street, London. Possible date of manufacture required please.*

Octet

The production of this *Pharmaceutical Historian* is borne by WinPharm (Winthrop Pharmaceuticals) division of Sterling-Winthrop Group, Surbiton-upon-Thames, Surrey as a gesture to the history of pharmacy.
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Contributions to the Editor: Arthur Wright F.P.S., D.B.A. · 36 York Place · Edinburgh · EH1 3HU

BSHP Calendar — 1983

February 24 — Joint Meeting with the Pharmaceutical Society of Great Britain — Dr. Margaret Pelling of the Wellcome Unit for the History of Medicine, University of Oxford to speak on the subject of her research work i.e. barber/surgeons in the 17th century — title to be confirmed.

April 15-17 — Spring Conference to be held in South Wales. Venue to be decided. It is intended to arrange a varied programme dealing with a wide variety of topics, similar to the successful Warwick Conference.

April 28 — Foundation Lecture — Dr. T.D. Whittet to speak on "The Crown and Anchor".

History Session BPC

It was unanimously agreed that the History Session at the British Pharmaceutical Conference was an extremely successful event. Members found the papers of extreme interest. Professor D.L. Cowen (Emeritus Professor Rutgers University, New Jersey, USA) spoke on "The Influence of the Edinburgh Pharmacopoeia and the Edinburgh Dispensatories". Dr. A.D.C. Simpson (assistant keeper, Royal Scottish Museum, Edinburgh) gave a paper on "Sir Robert Sibbald — The Founder of The Edinburgh Physic Garden". As in previous years R. Gordon Drummond Ltd sponsored the occasion and the Committee of the BSHP again wishes to record its appreciation for the continued support of the company.

Members were also able to visit the old pharmacy in York place and also browse among the books in the library whilst the staff of the Scottish office dispensed refreshments.

Honorary Members

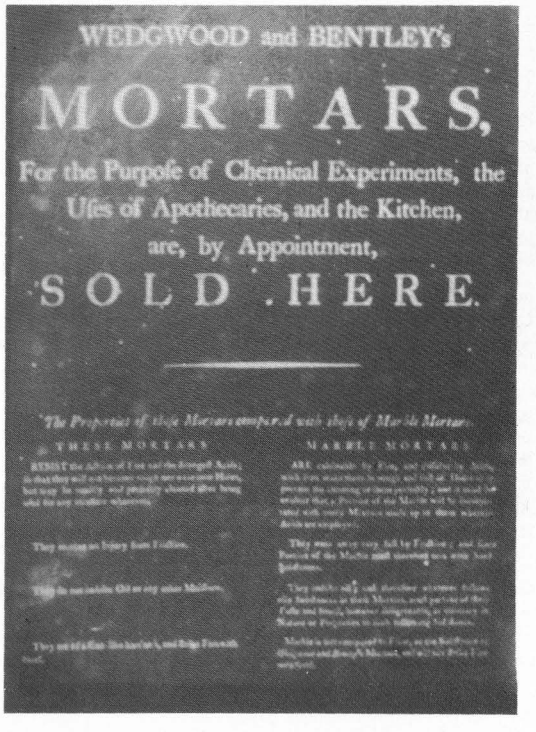
Two honorary memberships were granted during the History Session of the British Pharmaceutical Conference in Edinburgh in September.

The recipients were Professor D.L. Cowen and C.G. Drummond. Professor Cowen, Emeritus Professor of History, Rutgers University, is a member of the American Historical Association, the U.S. History of Science Society and the American Institute of the History of Pharmacy. He gave the Gideon de Laune Lecture Society of Apothecaries in 1976 and in the following year he received the Urdang medal of the American Institute of the History of Pharmacy. His writings on the history of pharmacy have gained him many international honours. He has been a long-standing member of the BSHP and regularly corresponds with other members in this country.

Charles G. Drummond, a founder member of B.S.H.P. is a retired proprietor pharmacist and is probably Scotland's most eminent pharmaceutical historian. For many years he has had articles published in the pharmaceutical press usually the result of his research into the history of pharmacy in Scotland. On the closure of his pharmacy in The Grassmarket, Edinburgh in 1961 he presented his complete "drug run" to the Pharmaceutical Society's Scottish Department where it has now been preserved as part of a museum. Mr. Drummond was for many years a member of the B.S.H.P. committee.

Pharmaceutical Historian

With the helpful cooperation of WinPharm this issue is larger than usual and it includes an Index for previous editions. This has been prepared by Leslie Matthews and fills a long standing need.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Composition Mortars: *An advertising leaflet issued during 1779 or 1780 (Courtesy of Josiah Wedgwood & Sons Ltd.)*

1983

The officers and members of the Committee wish all readers a New Year of great happiness and prosperity.

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The Influence of the Edinburgh Pharmacopoeia and the Edinburgh Dispensatories *

By DAVID L COWEN

The pre-eminence of Edinburgh as a centre of medical science in the 18th Century has received full, and deserved, attention from historians.[1] The influence on America particularly has been emphasized and the "Faculty of Medicine of the University of Edinburgh" has been called, rightly, the "mother of American medicine".[2] The leading American physicians, immigrants and native born, were Edinburgh trained.

What has not been given its proper attention is the influence on pharmacy that emanated from Edinburgh. This influence derived from two widely disseminated and highly respected publications, the Pharmacopoeia of the Royal College of Physicians of Edinburgh and the *Edinburgh New Dispensatory.* The Pharmacopoeia contained what was essentially a catalogue of simples and a collection of prescriptions and directions and was intended to set the standards for, if not be binding on, the pharmacist. The Dispensatory was essentially a pharmacist's handbook: its first part contained the Elements of Pharmacy and Pharmaceutical Chemistry; the second part described the Materia Medica in considerable detail, including the medical indications for the use of the drug; and the third part consisted of a body of Compositions in various dosage forms with formulas and directions.

The Pharmacopoeia, which had been the first order of business when the Royal College of Physicians came into existence, was first published in 1699 and continued for a century and a half, going through 12 editions, the last in 1841. Its compilation and publication ceased in expectation of the development of a British Pharmacopoeia.[3] The *Edinburgh New Dispensatory,* a continuation and up-dating of William Lewis' *New Dispensatory,* was first published in Edinburgh under the editorship of Charles Webster and Ralph Irvine in 1786 and continued to be frequently revised (there were twelve editions) first by Andrew Duncan, Sr., then John Rotheram and finally Andrew Duncan, Jr., until 1830.[4].

What made these two Edinburgh publications particularly influential was that they were frequently revised (which the London Pharmacopoeia was not). The Edinburgh Pharmacopoeia was revised almost once in every decade; the Dispensatory went through 12 editions in 44 years. Thus both publications enjoyed a currency lacking in similar compilations. Furthermore leading figures in Edinburgh medicine, some of whom were prominent scientists were involved in the compilation and revision work. Robert Sibbald, Archibald Pitcairne, Charles Alston, John Pringle, William Cullen, Andrew Duncan, Sr. and Jr., Joseph Black, Alexander Monro, secundus, and Robert Christison among others, all had a hand in the process of pharmacopoeial revision.[5]

The Edinburgh compilations thus provided the pharmacist and the physician with the advances in therapeutics, the materia medica and science. This was especially significant for the processes of pharmacopoeial cleansing, of adding new findings, and the new chemical and botanical nomenclature and knowledge.

The Edinburgh Pharmacopoeia was in the forefront of the elimination from the materia medica of the claptrap that had cluttered it from time immemorial.[6] Thus the animal simples, for example, were reduced from 47 to 27 in the fifth (1756) edition and to 10 in the eighth edition (1774), both, be it noted, long before the famous revision of 1788 of the London Pharmacopoeia.[7] In fact, the total number of simples dropped from 590 in the third edition (1735) to 222 in the ninth (1803).

The most important of the revisions was that of the fifth edition of 1756. Given the state of medical science at the time, it did as good a job as could be expected in ridding the materia medica of what it called "superstition", "credulity", and "established custon".[8] Foremost in its cleansing was the elimination of the Theriac and Mithridate, probably the first pharmacopoeia to eliminate these polypharmaceuticals that had adorned the physician's armamentarium for two millenia. The London Pharmacopoeia, whose fifth edtion of 1746 was not revised until 1788, did not follow suit for 32 years.

The addition of new drugs was also important in keeping the Pharmacopoeia up-to-date. Thus aconite, colchicum, pulsatilla and stramonium were added in 1774 on the basis of what we would consider very rudimentary pharmacological studies of Dr. Anton Störck of Vienna. A much more significant illustration is what occurred, in both the Pharmacopoeia and the Dispensatory, with regard to digitalis. The fox-glove had had a place among the vegetable simples of the first four editions of the Pharmacopoeia but was dropped in the 1756 revision, perhaps because the noted Boerhaave considered it poisonous. In 1783 digitalis was again added to the official list for the committee which completed the work on that (seventh) edition included Drs. John Hope and James Hamilton, both of whom had experimented with digitalis at the Ediburgh infirmary.[10] It was in the Dispensatory, however, that we have a complete picture of the process of keeping current. Lewis' *New Dispensatory* of 1753 had given digitalis a bare paragraph, describing the plant, attributing questionable uses against scrofulous tumors and epileptic disorders to it, and noting Boerhaave's disfavour.[11] The first edition of the *Edinburgh New Dispensatory,* in 1786 repeated the same paragraph, but added another that mentioned its use in dropsy, particularly that of the breast, that is to say, as a diuretic.[12] In 1789, when Andrew Duncan, Sr. became editor, we find mention of Dr. Withering's work, and, while still emphasizing the diuretic qualities of the drug, noted the ability of it to slow the pulse. (Side effects — vertigo and "affection of vision" were also noted, as were several other uses).[13] By 1803 the Dispensatory, this time under Andrew Duncan, Jr., had a fuller account, adding various dosage forms and noting also its usefulness for palpitations.

Finally, the high quality of the Edinburgh compilations reflected also their rapid incorporation of the new science of the late 18th Century. The Pharmacopoeia had introduced the nomenclature of Linnaeus' *Species Plantarum* in 1774, the Dispensatory carried a discussion of Bergmann's chemical nomenclature in 1786, and, most significant, from 1791 the Dispensatory included "A full and clear account of the New Chemical Doctrines of Mr. Lavoisier." This was probably the first pharmaceutical work to embrace Lavoisier's chemistry,[15] and when in 1803 (not 1805 as sometimes stated in the literature) the Edinburgh Pharmacopoeia incorporated the "new names [and] the terminology of Lavoisier" it was one of the earliest pharmacopoeias to do so, perhaps third to the Spanish and Austrian pharmacopoeias of 1794.[16] Most influential, however, was the material in the Dispensatory, for thereby Lavoisier's work, to quote two students of Lavoisier, "unquestionably reached a wide body of pharmacists and physicians [in the United States] and popularized the new nomenclature; [and] the number of individuals and institutions reached by this pharmaceutical work was considerably more than those who received the speical monographs on the nomenclature of the new chemistry." [17]

The Edinburgh Pharmacopoeia consequently enjoyed a

* Abstract from a paper given at The History of Pharmacy Session, British Pharmaceutical Conference, Edinburgh, Sept. 1982.

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"meaningful reputation", to use the words of a German commentator in 1805.[18]

The few sales records that we have offer tangible proof of the success of the Edinbugh Pharmacopoeia. The 1774 printing of 2,050 copies was "mostly sold off" by September, 1775. The 1803 edition was made necessary because the first (1839) had already "been disposed of." In Germany, Baldinger's *Edition in Germania Altera* of 1784 was "quickly sold."[19]

But the flattery of imitation is perhaps a better indication of the reputation and influence of the Edinburgh Pharmacopoeia. The Edinburgh Pharmacopoeia was reprinted, without the authorization of the Royal College of Physicians of Edinburgh, at least 16 times that have been verified and perhaps as many as 14 more times that are referred to in the literature but could not be verified. Its first reprinting was in London of 1732 and then in 1736. These became the basis of a reprint in Florence about 1759. It was also reprinted in Göttingen, in Venice, in Bremen, in Geneva, in Leipzig, in Rotterdam, in Augsburg, and in Milan. In addition, the second (two printings), third, fourth and fifth editions were each translated into English by Peter Shaw and the fourth edition translated also by William Lewis and by John Thomson. The sixth edition was translated into Dutch and the twelfth from its original English into German.[20]

The Edinburgh Pharmacopoeia was not alone in the vast number of practitioners that were reached through the dispensatories and conspectuses that became a British speciality. The London Pharmacopoeia, and later the Dublin Pharmacopoeia were also incorporated into these publications. The later editions of Quincy's *Pharmacopoeia Officinalis et Extemporanea,* Colborne's *A Complete English Dispensatory,* Brooke's *General Dispensatory,* Coxe's *American Dispensatory,* Thacher's *American New Dispensatory* and, most important of all, Lewis' *New Dispensatory* and its successor the *Edinburgh New Dispensatory* all served to propagate the Edinburgh Pharmacopoeia. The influence of these publications extended beyond the British Isles and America. Brookes, for example, was published three times in German and Lewis' *New Dispensatory* was published no less than seven times abroad, in German, Dutch, French and Portuguese.[21]

Similarly the conspectuses played an important role in the dissemination of the Edinburgh Pharmacopoeia. Works like Graves' *Pocket Conspectus,* Thomson's *Conspectus* and Foote's *Practitioner's Prescriber* were not only printed in Britain in some profusion but also in the United States a number of times. In 1820 a Conspectus of the three British pharmacopoeias and the Paris Pharmacopoeia was issued in French, and was said to be "the first work of this kind" in France, and in 1827 a German edition of Thomson's *Conspectus* appeared.[22]

We still have other evidence of the reputation of the Edinburgh Pharmacopoeia as well. In Sweden, Berzelius quoted from it in his lectures.[23] In Russia it was said to have been in use many years before Chrichton published his Petersburg Pauper's Pharmacopoeia (1807). In America, Dr. John Morgan's description of the course in materia medica that he was instituting in the new medical school in Philadelphia in 1765 included "some critical lectures on the chief Preparations contained in the Dispensatories of the Royal College of Physicians of London and Edinburgh."[24] In both Russia and Italy compilers of pharmacopoeias acknowledged their indebtedness to the Edinburgh and London Pharmacopoeias.[25]

The Edinburgh Pharmacopoeia was undoubtedly of prime importance in the pharmacopeial development in the United States. George Urdang has shown that the Edinburgh Pharmacopoeia "has to be considered the primary source" of the Lititz Pharmacopoeia of 1778.[26] (The Lititz Pharmacopoeia is the name given to the pharmacopoeia of the American Army Hospital at Lititz, Pennsylvania in the American Revolution). The first civilian American pharmacopoeia, the Pharmacopoeia of the Massachusetts Medical Society of 1808, although it contained a good deal of material pertinent to the American scene, acknowledged that the Edinburgh Pharmacopoeia "was the basis of their own", with so "little variation from that excellent work" that it seemed to deny theirs "the appearance of originality."[27] Moreover, "more than 90 per cent of the articles in the Massachusetts Pharmacopoeia were included" in the first United States Pharmacopoeia of 1820.[28] That is to say, the Massachusetts Pharmacopoeia was the child of the Edinburgh Pharmacopoeia and the United States Pharmacopoeia was the grandchild. It is interesting to note that three of the five men most responsible for the Lititz, Massachusetts and New York Hospital Pharmacopoeias were Edinburgh trained.[29]

The *Edinburgh New Dispensatory* was, in the midst of the many dispensatories being published in Great Britain, by far the outstanding publication of its kind. The third and fourth editions of the *Encyclopaedia Britannica,* for example, noted that "the latest and most esteemed, beside the London and Edinburgh Pharmacopoeias, is the Edinburgh New Dispensatory."[30] "Few works", the *Britannica* went on to say in 1810 and 1823, "have had a more extensive circulation. . . It is perhaps the most complete guide to the practical apothecary we have in any language."[31]

The *Edinburgh New Dispensatory* had a wide circulation in America,[32] its reputation, rested on its pharmaceutical and medical content. It was, after all, the most comprehensive and best text-book on pharmacy of its day. It is therefore not surprising that it was reproduced in German (at least three times), in French, in Italian, and possibly in Dutch. In the United States it was copied twice in Philadelphia, in Walpole, New Hampshire, in Worcester, Massachusetts, and in New York.

The greatest influence of the *Edinburgh New Dispensatory,* like that of the Edinburgh Pharmacopoeia, was as progenitor of American Dispensatories. The first indigenous *American Dispensatory* by John Redman Coxe in 1806 was "committed to the public, with little deviation from the Edinburgh copy" and actually included Dr. Duncan's Preface. Coxe's own preface noted that he had "confined himself" to the formulae "of the Edinburgh College" and that he had retained the nomenclature of, and as much of the chemistry "as possible" from the "Edinburgh Dispensatory."[33] Whether Coxe referred to the Pharmacopoeia or the *Edinburgh New Dispensatory* in these remarks, is not clear, but the Edinburgh influence is quite obvious.

The second such American publication, the *American New Dispensatory,* which appeared in 1810, by James Thacher, was much more like the Edinburgh New Dispensatory in format. Although Thacher sought to make his work more suited to American practice (he based it on the Massachusetts Pharmacopoeia) he nevertheless acknoweldged his indebtedness to Duncan[34] and even a perfunctory examination reveals his very great debt to the *Edinburgh New Dispensatory.*

There was still a third pharmacopoeial publication emanating from Edinburgh that was republished abroad. That was the Pharmacopoeia of the Royal Hospital. It was published at least twice (possibly four times) in Frankfurt and Leipzig and at least once in Geneva.[35]

Andrew Duncan, Jr. died in 1832 and the *Edinburgh New Dispensatory* that had been published two years earlier was the last of the series. In 1842, however, Sir Robert Christison's *A Dispensatory or Commentary on the Pharmacopoeias of Great Britain* was published. It "was founded to some extent upon [Duncan's] Dispensatory,"[36] but it went through only two editions (1842, 1848) and was once reprinted in the United States.[37] It did not have the extended influence of its predecessor — by the 1840s the *American Dispensatory* and the *American New Dispensatory* had given way to the *Dispensatory of the United States* and the United States Pharmacopoeia was already in its second revision — but Christison's *Dispensatory* was said to have helped pave the way for the first, 1864, Pharmacopoeia of Great Britain and Ireland.[38] Christison was, after all, Chairman of the General Medical Council Committee charged with the task of compiling that British Pharmacopoeia.[39]

Pharmacy — and one must remember that pharmacy was also a part of medical practice well into the 19th Century — thus had its scientific synthesis and its source of instruction in these pharmacopoeial publications emanating from Edinburgh.

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Notes

1. See J. Randall, "The Influence of the Edinburgh Medical School on America in the Eighteenth Century," in R.G.W. Anderson and A.D.C. Simpson (eds.), *The Early Years of the Edinburgh Medical School* (Royal Scottish Museum, Edinburgh, 1976), pp.95-124; J.Z. Bowers, "The Influence of Edinburgh on American Medicine," in G. McLachlin (ed.), *Medical Education and Medical Care: A Scottish-American Symposium* (Nuffield Provincial Hospitals Trust, Oxford University Press, London, 1977), pp.3-23.
2. Bowers (fn.1, above), p.3.
3. D.L. Cowen, "The Edinburgh Pharmacopoeia," *Medical History* 1 (1957) 1213-139, 340-351; D.L. Cowen, "The Edinburgh Pharmacopoeia," in Anderson and Simpson (fn.1, above), pp.25-45.
4. D.L. Cowen, "The Edinburgh Dispensatories," *Papers of the Bibliographic Society of America* 45 (1951) 85-96.
5. Cowen, "The Edinburgh Pharmacopoeia," in Anderson and Simpson (fn.1, above) 33-34.
6. *Ibid.*, pp.30-32; and Cowen, "The Edinburgh Pharmacopoeia," *Medical History* (fn.3, above), 125-126.
7. D.L. Cowen, *The Spread and Influence of British Pharmacopoeial and Related Literature* (Wissenschaftliche Verlagsgesellschaft, Stuttgart, 1974), p.16.
8. *Pharmacopoeia Collegii Regii Medicorum Edinburgensis* (Hamilton et al, Edinburgh, 1756), p.iii.
9. See J.K. Crellin, *Plants in Medicine: From Yesterday to today* (Medical History Program, Duke University, Durham, N.C., 1982), p.35.
10. Cowen, "The Edinburgh Pharmacopoeia," *Medical History* (fn.3, above), pp.126-127.
11. W. Lewis, *The New Dispensatory* (Nourse, London, 1753), p.123.
12. C. Webster and R. Irvine, *The Edinburgh New Dispensatory* (Elliott, Edinburgh, 1786), p.136.
13. A. Duncan, Sr., *The Edinburgh New Dispensatory* (Elliott, Edinburgh, 1789), p.183.
14. A. Duncan, Jr., *The Edinburgh New Dispensatory* (Bell & Bradfute, Edinburgh, 1803), pp.218-219.
15. K. Ganzinger, "Zur Geschichte der chemischen Nomenklatur in den amtlichen Arzneibüchern," *Beiträge zur Geschichte der Pharmazie* 31 No.5 (1980) 33-34.
16. *Ibid.*, and D.L. Cowen, "A Note on Pharmaceutical Literature and the Introduction of the New Chemical Nomenclature," *Beiträge zur Geschichte der Pharmazie* 31 No.11 (1981) 84. The London Pharmacopoeia did not incorporate the Lavoisier nomenclature until 1809. M.R. Crosland, *Historical Studies in the Language of Chemistry* (Harvard University Press, Cambridge, Mass., 1962), p.201.
17. D.I. Duveen and H.S. Klickstein, "The Introduction of Lavoisier's Chemical Nomenclature in America," *Isis* 45 (1954) 292.
18. *Allgemeine Medizinische Annalen des Neunzehn Jahrhunderts auf das Jahr 1905* (Altenburg), p.623.
19. Cowen, "The Edinburgh Pharmacopoeia," *Medical History* (fn.3, above), p.134.
20. For a checklist of the various issues, *Ibid.*, pp.343-351. A more up-to-date list, but still missing a Venice, 1782 printing, is found in Cowen, *The Spread and Influence. . .* (fn.7, above), pp.33-35.
21. *Ibid.*, pp.49-51.
22. *Ibid.*, pp. 55-57. The quotation is from *Journal Universal des Sciences Medicales* 20 (1820) 79.
23. M. Mogid, "Pharmaceutical Education in Sweden at the Time of Berzleius," *Atti e Memorie dell' Academia Italiana di Storia della Farmacia,* in *La Farmacia Nuova* 24 No.12 bis (1968), reprint, p.5.
24. W.F. Norwood, *Medical Education in the United States before the Civil War* (University of Pennsylvania Press, Philadelphia, 1944 p.64.
25. William Batt in Genoa, Italy (1785) and Sir James Wylie in Russia (1808). See Cowen, *The Spread and Influence. . .* (fn.7, above), p.7.
26. G. Urdang, "Addenda to the Lititz Pharmacopoeia," in *Documents Pertaining to the Medical Supplies within the North American Colonies* (Madison, Wis., 1944), pp.5, 13.
27. D.L. Cowen, *(America's Pre-Pharmacopoeial Literature* (American Institute of the History of Pharmacy, Maidson, Wis., 1961), p.23
28. Quoted in G. Sonnedecker, *Kremers and Urdang's History of Pharmacy* 4th ed. (Lippincott, Philadelphia, 1976), p.262.
29. The three were William Brown (Lititz), John C. Warren (Massachusetts) and Samuel L. Mitchill (New York Hospital). James Jackson (Massachusetts) had some London trainig; Valentine Seaman (New York Hospital) had no British training.
30. *Enclyclopaedia Britannica* 3rd ed. (Bell & Macfarquhar, Edinburgh, 1797) Vol. 6, p. 50; *Idem,* 4th ed. (Bell, Edinburgh, 1810), Vol. 7, p.260.
31. *Ibid.,* 4th ed., Vol. 12, p.687; 6th ed. (Constable, Edinburgh, 1823), Vol. 12, p.687.
32. Cowen, *America's Pre-Pharmacopoeial Literature* (fn. 26, above), p.11.
33. J.R. Coxe, *The American Dispensatory* (Philadelphia, 1806),
34. J. Thacher, *The American New Dispensatory* (Wait, Boston, 1810) p.8.
35. Cowen, *The Spread and Influence.* (fn. 7, above), p.36.
36. J.D. Comrie, *History of Scottish Medicine* (Wellcome, London, 1932), Vol. 2, p.618
37. R. Christison, *A Dispensatory, or Commentary on the Pharmacopeias of Great Britain (and the United States)* 2nd ed. (Lea & Blanchard, Philadelphia, 1848).
38. Comrie (fn. 36, above), vol. 2, p.618.
39. W.S. Craig, *History of the Royal College of Physicians of Edinburgh* (Blackwell Scientific Publications, Oxford, 1976), p.98.

Sir Robert Sibbald founder of the Edinburgh Physic Garden *

By A.D.C. SIMPSON

Scotland's capital in 1650 was a medieval clutter of dwellings in the shadows of the castle, confined within an ancient wall and centred on the High Street which sloped from the Castle down to Holyrood Place. The two kingdoms shared a monarch, and although the King and Court were normally in the south, the Scots Parliament still met in Edinburgh, and the Capital was still the Country's political power base.

The medical needs of the city and the surrounding country were served by apothecaries and surgeons, together with the handful of physicians who had travelled abroad to study at one of the few continental medical schools.

One of the physicians was Robert Sibbald, a rather remarkable man, a man with wide and cultured interests, who contributed with distinction to academic fields as diverse as archaeology, botany and the study of whales. Although his work was important in his day, it was soon overshadowed, and today Sibbald is remembered largely for the institutions he created.

In particular, almost exactly 300 years ago he established the Royal College of Physicians of Edinburgh — the body produced and controlled the official pharmacopoeia (for the English Pharmacopoeia had no authority in Scotland) — and a few years earlier he set up the first public physic garden.

The physic garden and the others that were being set up in medical centres across Europe, were important in many ways: They provided a focus for the scientific study and classification of plants and their therapeutic use; they played a central role in the teaching of medicine and pharmacy; and (in a commercial sense) they provided essential supplies of fresh material for practicing pharmacists.

Robert Sibbald was born in Edinburgh in 1641. His father held political office as Keeper of the Great Seal of Scotland, and his uncle was a senior physician. Sibbald's early life is carefully set out in his rather endearing autobiography, where we read of the hardship suffered by the family in the civil war of the 1640s, of his education for the church and of his decision to enter medicine. His studies inevitably took him to the great medical centres of Europe, first at the protestant University of Leiden and then at Paris and elsewhere in France. Returning to Scotland two and a half years later with his medical degree and aged 21, he was faced with supporting his widowed mother and family and clearing accumulated debts. With introductions from friends and relatives he gradually built up a respectable and successful practice in and around Edinburgh.

Not long afterwards, Sibbald was joined in practice by his kinsman Andrew Balfour, ten years his senior, and the two were to become professional colleagues. Both Sibbald and Balfour set up private gardens in Edinburgh for use in dispensing, and Balfour was sent seeds by his many correspondents at home and abroad. One of these was the King's Botanist, Robert Morison, under whom Balfour had studied in France, and who in 1669 was appointed to the garden and chair of botany at Oxford. Whether it was this that prompted them to propose a public physic garden for Edinburgh we do not know, but in 1670 we find Sibbald and

* Abstract from a paper given at The History of Pharmacy Session, British Pharmaceutical Conference, Edinburgh, Sept. 1092. Dr Simpson is Assistant Keeper, Royal Scottish Museum, Edinburgh.

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Balfour leasing a plot of land at Holyrood, and employing James Sutherland, "a youth, who, by his own industry, had attained great knowledge of the plants" to cultivate it. The plants initially came from their own gardens and from the large collection of a friend of Sibbald's, Patrick Murray of Livingstone, uncle of Patrick, Lord Elibank.

A number of other physicians were persuaded to support the venture financially, and this immediately brought opposition from the Incorporation of Surgeon-Apothecaries which was suspicious of the physicians' motives. The Incorporation had its own physic garden and held jealous control over the town's apothecaries: worst of all it saw in the scheme the germ of a rival body, a college of physicians, and this it was determined to resist. Sibbald, who clearly played second fiddle to Balfour in the venture, tells us that it was Balfour's skill and diplomacy that won the surgeons round, and this he did with such conspicuous success that the Incorporation's protector, the Town Council, granted Sutherland the lease of a larger piece of land in 1675. A number of gentry and influential bodies such as the Faculty of Advocates had been flattered into supporting the garden and the Town Council granted a salary to Sutherland out of the University's funds although no university teaching was involved. The success achieved by Balfour was real enough, but the importance for Sibbald was that it provided him with a valuable lesson in the operation of the Scottish patronage system.

The years were difficult ones for Sibbald with his protracted family, legal and financial worries and the early death of his first wife. He might well have retired from Edinburgh to practise from his newly-acquired seat at the Kipps, near Linlithgow, had he not been swept along by his association with the rising star of James Drummond, Earl of Perth. Sibbald had effected an introduction through a cousin some time before and had been flattered to find that Perth was anxious to encourage his antiquarian and scientific interests. From their discussions and correspondence a friendship was struck, and when Perth's physician died in 1678, Sibbald was appointed in his place and was advanced in the Earl's circle.

Perth, and more so his brother, John Drummond, later Viscount Melford, were to become noted for their unscrupulous politics. Both became members of the King's highly influential Privy Council, and Perth played a significant part in ousting the Lord High Commissioner for his handling of the increasingly serious civil unrest that was threatening to engulf the country. Charles's reaction was to install as Commissioner his own brother, the future King James, Duke of Albany and York, whose openly professed catholicism was in any case proving a serious embarrassment in London. James spent the next two and a half years at Holyrood in effective exile, where he came increasingly under the influence of the two Drummond brothers, who were rapidly elevated by him and were soon to dominate the Scottish corridors of power.

It was now that the opportunity arose for establishing the College of Physicians. An Edinburgh apothecary, Patrick Cunningham, had been charged by the Incorporation of Surgeon-Apothecaries with performing a surgical operation, namely letting blood, and the case had developed into a complex hearing before the Lords of Session about the desirability or otherwise of separating the two callings of surgery and pharmacy: in the course of this the Lords sought advice from several "disinterested. learned and skilful physicians", including Balfour, about the normal practise abroad. The question was put by them to a meeting of the City's physicians, called presumably with the real intention of allowing Sibbald to urge that they should secure their own privileges which "belonged to us as doctors" by seeking to establish a College of Physicians. Again diplomacy was handled by the well-connected Balfour, but this time Sibbald was certainly the driving force. The initial approach was made to Sir Charles Scarborough, the King's principal physician, who was in attendance on James at Holyrood, and who was already well known to Balfour. The matter was handled well, and James signified his firm approval and told them to petition the Privy Council. Urgent objections of course began to flow in from bodies who felt their traditional privileges might be infringed. Diplomatic concessions were made to the Scottish universities but the Privy Council, largely due to the active support of Perth and his brother, were able to ride roughshod over the objections of the Surgeons. The charter was duly granted in late 1681, but it was more than three years before there was a parliament that could ratify it. In the meantime the Lords of Session had conveniently ruled for a separation of surgery and pharmacy and the apothecaries were now under the protection of the physicians.

The issue was essentially one of the rights and privileges of the various medical groups in the City, and of their relative status. The City's surgeons were grouped in an exclusive trade incorporation or craft guild, protected by the Town Council from encroachment. Like the surgeons, the apothecaries trained entrants by an apprenticeship system, but unlike them they did not enjoy incorporated municipal status. Since the apothecaries not only dispensed drugs but also prescribed them, they also acted in the capacity of physicians; but whatever their medical comptence they lacked the physician's academic experience and qualification with all the social prestige that conferred. A 17th century 'pecking order' might therefore be: physician, apothecary, surgeon. But the position had been complicated by the Surgeons' admission of two apothecaries in 1645. This led to dual apprenticeships in surgery and pharmacy and a new category of surgeon-apothecary within the Incorporation, and eventually in 1657 to a so called 'Fraternity of Apothecaries and Surgeon-Apothecaries' under the Incorporation's wing, enabling the Incorporation to exercise control over the apothecaries. Whereas the simple apothecaries were barred from undertaking surgical operations within the liberties of Edinburgh, the increasingly successful surgeon-apothecaries were able to undertake the whole range of medical activity.

It was this invasion of the physicians' domain of internal medicine by surgeons that angered the academically-qualified doctors. In particular they were concerned that these aspirant medical practitioners were receiving training only in practical skills, undermining the central value placed by the physician on the possession of a classically-based university degree. For the particular group of physicians of which Sibbald was the most active campaigner, the granting of the charter to the College at once recognised the physicians' dominant position in the medical heirarchy that was felt to be theirs by right, and also confirmed them as the enlightened and honourable guardians of medical standards and practice.

Perth's patronage, which had been directed towards Sibbald's aims for the College, now advanced him personally. In September 1682 he was appointed Physician-in-Ordinary to Charles II, and three months later he was given the slightly unexpected title of Geographer Royal for Scotland. In his commission, Sibbald was charged with producing not only his long planned natural history of Scotland but also an atlas, a geographical description on historical and topographical lines.

Sibbald threw himself into the venture with an enthusiasm that was only to wane when he realised that he was to get no financial encouragement for the work. Sibbald subsequently claimed that he had spent over a thousand pounds on the Atlas's preparation, mainly in buying books and manuscripts, and it was certainly taken as far as draft form although the complete work never materialised. He had more success with his natural history of Scotland, the *Scotia Illustrata*, which appeared in 1684 in the guise of *Scotia Illustrate,* which appeared in 1684 in the guise of a 'prodromus' or introductory treatise for the Altas.

In December 1684 Sibbald had at last become president of the College of Physicians. In February 1685 Charles II died, and Scotland found itself with a Catholic monarch. The influence of the Earl of Perth and his brother was increasing daily, and as Lord Chancellor and Secretary of State respectively the two Drummond brothers were now to enjoy a period of three years as uncrowned kings of Scotland. To cement relations between the College and his powerful patrons Sibbald now very prudently arranged for both to be elected Fellows.

The first fruits of this cultivation were seen in March when the

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Town Council elected Sibbald as the first professor of medicine in the University, and provided him with rooms for teaching. The traditional (and romantic) view, is that Sibbald's appointment demonstrated not only the Council's respect for his abilities, but also a singularly enlightened attitude to medical education. In practice the Chancellor had raised the issue and had nominated Sibbald, giving the Council an offer it could not refuse. It could however refuse to pay him a salary which is precisely what happened.

The Privy Council had just confirmed the College's right to inspect the apothecaries, and one of Sibbald's first acts as President was to authorise the production of the much delayed pharmacopoeia that would provide the legal basis for regulating pharmaceutical practice. The College was also faced now with designing a method for the training and examination of apothecary apprentices and we know that this was occupying Sibbald at the time. Possibly Sibbald had concluded that the apothecaries in training should now have higher instruction available to them, and his University appointment was merely a convenience for avoiding the restriction in its charter that prevented the College from teaching. In the process the University had acquired a complete medical faculty, but Sibbald himself was very soon barred from teaching by an unexpected obstacle — his conversion to Roman Catholicism.

The Scots Parliament, faced with the prospect of a Catholic succession, had passed the Test Act in 1681, requiring all officials to swear allegiance to the King but at the same time to renounce the Covenant and Catholicism.

There was outcry when Sibbald's conversion became known: ministers thundered from their pulpits, and he was the subject of invective such as a surgeon's prescription for 'a Catholick pile to purge out Christianity". Unable to take the Test, Sibbald had to relinquish the office of President of the College in November. His situation got progressively worse, until at the end of January 1686 a mob stormed his house and he fled in fear of his life, first under armed guard to Holyrood, and then on to London. After some weeks in the south he became not only unwell but also disillusioned and, full of remorse, he returned to Edinburgh to re-embrace the Protestant faith, but he had done his reputation great harm and he had lost the sympathy of many friends and certainly of his patron.

When he returned to Scotland, Sibbald apparently stayed largely in retirement. This was a period of reflection, devoted to his country practice and his more scholarly pursuits. In 1687 his pen was busy too, he collaborated with the Royal Engineer, John Slezer, in Slezer's *Theatrum Scotiae* a series of views of towns and country seats. It appeared in 1693.

He was also invited to contribute to the young Edmund Gibson's new and enlarged edition of William Cabden's *Britannia.* Sibbald's reputation as the leading Scottish antiquary led to his inclusion in a powerful team of scholars alongside such as John Aubrey, Samuel Pepys, Robert Plot, Edward Lhwyd and William Nicolson. Gibson's 1695 edition, became the standard version epitomising the new spirit of antiquarianism — and at the urging of Pepys it was couched in the Royal Society's "plaine English".

Sibbald, probably in 1699, tried to launch a 'Royal Society of Scotland' whose remit was to include "Husbandry, Gardenry, Medicine and the Knowledge of Natural things". Significantly the society's officers were to include a chemist and an anatomist.

Sibbald also wrote a pamphlet entitled *Provision for the Poor in Time of Dearth & Scarcity* in which he described the wild foods of all types that could be used "when the ordinary Provisions fail, or are very dear". Marine animals in particular were an underused and ill-understood resource, and this was an area in which Sibbald had already made perhaps his most important contribution. The opportunity to study a number of whales stranded on the east coast had prompted Sibbald to give one of the first accounts of the natural history and classificaiton of these great mammals. The work was enthusiastically received and later resulted in the Blue Whale being named for him as *Balaenoptera Sibbaldi* or Sibbald's Rorcqual.

He returned to this theme in 1701 in his unpublished marine natural history *Caetologia,* in which he used his knowledge of whale and fish products to propose ways of making their exploitation "more profitable to the Government and of greater Benefit to...the Nation".

Increasingly however it was antiquities, and a preoccupation with Roman Scotland, that occupied the closing phase of Sibbald's life. He was an early exponent of what later came to be known as 'Agricolamania'. His own collection of antiquities contained inscribed Roman stones and an important bronze age hoard (thought to be Roman) from Fife.

But Sibbald's lasting memorial must be his physic garden, which thrives to this day; and how appropriate that of all Sibbald's interests to have survived in this way, he should be remembered by his contributions to pharmaceutical botany.

Questions and Answers

Members are encouraged to add their comments on the questions or answers for possible inclusion in future issues of *Pharmaceutical Historian.* Please quote reference number — Editor.

Reply to Pharmaceutical Historian
Vol. 12 No. 1 April 1982 **8212 Mortars.** *Is there any means of distinguishing between mortars made for pharmaceutical use and those for domestic use?*

The last issue of the Pharmaziegeschichtliche Rundschau bibliography included the first part of a special mortar bibliography by Dr. Wolfgang Hömberg, Apotheker, Olbergweg 17, D-4200 Oberhausen. If English colleagues have any special queries on this topic they are encouraged to contact Dr. Homberg or me

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Reply to *Pharmaceutical Historian* Vol. 12 No. 2 August 1982 **8216 Holloway's Ointment Jar** *bears an address 533 Oxford Street, London. Possible date of manufacture required please.*

According to Dr. F.C. Tring Thomas Holloway and his Patent Pills in *Pharm. Hist.* 1977 Vol. 7 No. 3 "In 1867 Holloway moved to new premises in Oxford Street". This suggests that Octet's jar may be dated 1867.

L. G. Matthews

8217 Glossary. Is there a glossary which gives the full Latin names — and translations — of the abbreviations seen on apothecaries jars?

Minimus

8218 Wound treatment. An early treatment of wounds involves the use of "dossils". Can any reader tell me what dossils are?

Quantum

8219 Harker Stagg & Morgan. Has there been a history written on this wholesaler/manufacturer?

Gentian

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Dental Formulae

By W. E. COURT

Dentistry arrived late on the Western scene if one considers the vocation in terms of organised professional activity. Nevertheless teeth have caused problems since the dawn of civilization and, in most societies, the possession of sound even teeth has always been considered aesthetically desirable despite the practice of the removal of sound teeth as tribal ritual in a few primitive communities.

Early records refer to Assyrian and Egyptian use of opium to kill the pain of earache and toothache. Roman laws in the 5th century B.C. mentioned gold-bound teeth and burial procedures underlining both the value of gold from earliest times and man's apparent inherent greed. Roman medicine also included dentistry and recorded Octavia's tooth powder, charcoal perfumed with oil of spikenard. This preparation was apparently in the armamentarium of Scribonius Largus, physician to the Emperor Claudius at the time of the invasion of Britain, A.D. 43.

In Britain it is recorded that in 1400 Henry IV conceded sixpence per day for life to one Matthew Flint, toothdrawer of the City of London, to carry on his profession.

By 1460 the Barber's Guild, which also had surgery under its wing, included toothdrawing amongst its activities although evidence indicates that the apothecaries also engaged in toothdrawing.

John Arderne, however, warned against the practice of tooth extraction. Said he "Let the tooth you want to remove be rubbed with the gum of ivy and it will immediately fall out."

In the Middle Ages the extraction of teeth was practised and fillings were prepared from resins, gums and waxes. By the late Middle Ages leaf metals e.g. lead and silver were in use, gold being reserved only for the wealthy.

The training of the dentist appears obscure as dentistry was practised by the surgeons (surgeon dentists), by persons often apprenticed to watchmakers and jewellers (mechanical dentists) and by apothecaries.

The apothecaries apparently combined all the professions but in 1703 won the right to practice medicine, many becoming physicians and later, in 1878, many druggists left pharmacy to become dentists and assumed the title "dentist" under the Dental Act of that year.

Dentistry pre-1800 could be considered to face four problem areas at least:—

1) The use of medicinal applications versus toothache,
2) The removal of teeth and artificial substitution,
3) The removal of decay and the filling of the resultant cavity; major developments in this field were chiefly post-1800 as technological methods improved,
4) Attempts at prophylaxis to prevent or arrest disease states of the teeth or gums.

Toothbrushing as a form of oral hygiene has been practised since early times, the patient or practitioner using plant products such as twigs of the *Fagara* species in Africa and the West Indies, the stems and twigs of *Salvadora persica L.* in Africa and the hairy fruits of *Cnestis* species in Nigeria. In Europe the rays of the umbel *Amii visnaga* are known as Spanish toothpicks and in Britain chewing hazel wood was considered efficacious as it cleaned the teeth and hardened the gums. The acidic juice of strawberries was also used to dissolve tartar.

Brushing the teeth involved the use of cleaning agents and, just as Octavia of old used charcoal, later generations developed tooth powders and dentifrices based on three components:—

a). the alkaline mechanical base cleansers, usually chalk or heavy magnesium carbonate,

b) antiseptics e.g. borax, carbolic acid, quinine, to reduce acid fermentation between the teeth,

c) astringents e.g. myrrh, cinchona (tannin containing materials). Myrrh was particularly valued as an aromatic, local stimulant and disinfectant.

Thus Guy de Chauliac's toothpowder of the 14th century contained abrasives such as cuttle-bones, seashells, pumice, iris roots, salt and *Aristolochia*, an aromatic bitter with some local action on ulcers, and containing aristolochic acid, a nitro-compound related to thebaine.

By the 18th century in Britain mouthwashes were in common use and contained drugs such as:— Tincture of arnica, Tincture of myrrh, German Chamomile flowers, Bilberry berries, Bayberry leaf (Wax myrtle) and Essence of sassafras.

These drugs were primarily disinfectants although bilberry and bayberry contained tannins and were astringents hardening the gums.

In British herbal folklore one encounters breath sweeteners such as aniseed, cardamom, clove, angelica root, mastic, mint, orris, parsley, peppermint, sweet flag etc. and in dentifrices alder bark (in a vinegar decoction), charcoal, clove, lemon, mint, myrrh, nutmeg, orris, rhatany, cinchona, rose oil, sage, sassafras, soapwort, sweet flag, thyme and wintergreen.

Typical of the toothpastes of the time are these formulae:—

℞

Precipitated chalk	℥ j
Powd. myrrh	
Powd. rhatany root	aa 3ij
Powd. orris root	3j
Honey of roses q.s. to form a paste.	

Rhatany contained tannins and was astringent; Orris yielded a sweet violet odour but the calcium oxalate present could scratch enamel; Myrrh was antiseptic; Chalk provided an alkaline abrasive; Honey of Roses permitted paste formation.

℞

Cream of Tartar	℥ j
Powd. orris root	
Powd. red rose	aa ℥ ss
Oil of Cloves	gtt. x
Honey of roses q.s. to form a paste.	

Cream of Tartar (potassium acid tartrate) was an acid cleansing agent and the Oil of Cloves contained the disinfectant phenolic eugenol.

Therefore there was logic in these empirical recipes but the vehicle was unsatisfactory.

Honey of Roses (Mel. Rosae)

Red Rose Petals, dried	iv
Boiling water	Oiiss
Honey, despumated	lb v

Macerate the rose petals in the boiling water for 6 hours; then add the honey to the strained liquor, and boil down in a water bath to a proper consistency. A similar preparation, Honey of Borax, was also used being mildly antiseptic and astringent. However, for stability reasons, tooth powders were preferred to tooth pastes. Tooth powders usually contained abrasives, detergents, astringents and aromatic substances.

*Abstract from a paper given at the Spring Conference, University of Warwick, April 2-4, 1982.

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Soap functioned as the detergent, orris root as an abrasive, chalk and cuttlefish bone as mechanical adjuncts, clove oil as a phenolic disinfectant and lemon oil as a flavouring.

Colour was frequently added in the form of Dragon's blood, the red resin from *Daemonorops* species of palms or cochineal from the female *Dactylopius* beetle. Less attractive, although quite effective, being mechanical, disinfective and astringent, was the formulation containing powdered charcoal, powdered bark and powdered myrrh.

Liquid dentifrices were popular in the late 19th and early 20th centuries and present interesting formulations.

Rx

Tr. myrrhae	8.0 ml
Ol. gaultheriaea	0.1 ml
Spt. chlorof.	2.0 ml
Cremor magnesia	ad 125.0 ml

For brushing the teeth night and morning.

The magnesia countered acidity and offered a mechanical base to which the myrrh added a disinfectant action and the wintergreen oil and chloroform flavouring and preservative qualities respectively.

Other formulations included Tincture of Quillaia to reduce surface tension and increase the cleansing action.

For bleeding gums, tannin containing drugs such as kino and krameria were included in recipes. The herbalists also advised use of Tinture of Calendula (marigold) which acted as a local stimulant and, of course, an apple a day.

Although cleaning the teeth aided the development and preservation of the chewing apparatus, caries (decay) and periodontitis have caused problems throughout the ages and much energy has been devoted to the deadening of pain.

Early societies turned to the plant kingdom for relief. The North American Indians chewed the prickly ash bark *Xanthoxylum clava herculis* and the Californian Indians chewed the stalks of the gold-back fern (*Pityrogramma triangularis),* a fern yielding tannins and phenols which gave astringent and disinfective properties. Other Indians used the tips of the creosote bush, dripping the sap into cavities in the teeth. Chewing tobacco leaf was another way of deadening pain, the nicotine numbing the exposed nerves. Similarly *Fagara* bark is widely used in Africa often as a dressing for hollow teeth or as a pain deadener.

In Europe willow bark has a history and reputation as a cure for aches, especially headache and toothache.

In the 1800's a variety of treatments were popular for the treatment of odontalgia.

The numbing effect of the alkaloid aconitine is well-known and aconite and iodine preparations were used.

Arsenic, gr $\frac{1}{20}$ as an escharotic, destroys the pulp and when used for pain was often mixed with opium although the treatment frequently initially aggravated the pain.

Tannins in ethereal solution were considered good for treating odontalgia, especially when carious teeth occurred.

Creosote, coniine from hemlock dissolved in alcohol, opium, camphor and gelsemium were also employed, and capsicum as a strong infusion or tincture was used as a counter-irritant.

Ginger, mezereon and pyrethrum roots were all considered as useful masticatories in toothache although mezereon was rather dangerous, yielding an acrid resin and glycosides.

Although phenol itself was too dangerous, related compounds such as thymol, cresol, guaiacol, creosote and eugenol figured prominently in formulations. Eugenol, in particular, was employed to coagulate protein before filling cavities.

By the end of the 19th century interesting combinations were employed such as the recipe for tooth drops in 1897.

Rx

Lin. aconit. B.P.	
Chlorof.	aa3 $\overline{iii}$
Tinct. capsici	
Tinct. pyrethri	
Olei caryophylli	
Pulv. camphorae	aa 3ss

M. Sig. a few drops to be placed on a pellet of cotton wool applied to the cavity.

Morphine too appeared in toothdrops:—

Rx

Morphinae sulph.	gr iv
Atropinae sulph.	gr
Aquae Destill.	$\overline{3}$ j

M. Sig. A few drops on cotton placed in the cavity.

The use of cocaine as a local anaesthetic from 1884 onwards changed the face of dentistry.

Before its introduction calorific fluids were used to give light local anaesthesia.

Rx

Chloroform 1 oz.
Rectified Spirit 2 oz.
Citronella Oil 6 minims
Oil of Bergamot 30 minims

Mix.

To be applied to the gums as a fine spray or on absorbent cotton.

Rx

Chloroform	3iv
Tr. aconiti	3iv
Tr. capsici	3ij
Ol. caryoph.	3ss
Camphor	3ss

Mix.

To be applied to the gums as a fine spray or on absorbent cotton.

Ethyl chloride also was used as a local deadener.

From about 1890 cocaine supplanted the use of arsenic to destroy the pulp.

Cocaine permitted safer, painless methods for extraction and cavity filling without resort to the dangers of general anaesthesia.

Therefore just as in 1844 general anaesthesia was a great step forward, so in 1890, cocaine opened up a new era. Pre-1400 only loose teeth were removed; in the period 1400-1800 powerful extraction tools meant broken jaws in many cases, but cocaine opened up greater possibilities. The discovery of procaine by Einhorn in 1906 led to a new era of safe non-addictive local anaesthetics which dominated formulations of this century e.g. benzocaine solutions, amethocaine pastes, etc.

With good anaesthesia and formaldehyde or paraformaldehyde, cavities could be cleaned and roots destroyed. Tooth cements and cavity liners were therefore important and involved substances such as mastic, sandarac, balsam of tolu, resin and benzoin.

Metallic tooth cements included the triple amalgam of mercury, silver and ammonium. Gutta percha figured prominently as a temporary filler from 1870 onwards and zinc oxide pastes with eugenol or thymol were also used.

As one looks backwards it is apparent that a wide range of natural products were used for toothache, for neuralgia and for treatment of the gums. Yet the range of formulations used in dentistry does show a certain logic which is confirmed by modern chemical investigation of the plant materials.

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Communion and Contusion*

By A. WRIGHT

Joseph Priestley was born at Fieldhead, Birstall, about 10 miles South West of Leeds. His father was a pious Presbyterian weaver. When his mother died Priestley was brought up by an aunt at Old Hall, Heckmondwike. He lived with her from his sixth to 28th year, and was educated at Batley Grammar School. In 1751 he entered Daventry Academy to train for the Presbyterian Ministry, and in 1755 became minister at Needham Market, Suffolk. In 1758 he was at Nantwich where he opened a school. There he became interested in science, performing simple experiments for his pupils. In 1761 he was appointed classical tutor at Warrington Academy and two years later married the daughter of iron founder Isaac Wilkinson. He was awarded LL.D degree, Edinburgh University in 1764 for his *Chart of Biography* (lives of important people in history). Encouraged by Benjamin Franklin he wrote "The History and Present State of Electricity in 1767. Before it was published Priestley became an F.R.S. on June 12, 1766, and had become minister of Mill Hill Chapel, Leeds (1767).

Then began a period of great activity in many spheres. His religious beliefs had become unorthodox — he published the *Theological Repository* which aroused much hostility among the orthodox churchmen by declaring in favour of the autonomy of the individual congregations, and toleration of Roman Catholics. He was specially critical of a national church.

About the same time he forsook his studies in electricity and optics for combustion and chemistry. "Directions for impregnating water with fixed air" was his first chemical publication. Apparently in Leeds he first lived next to the brewery of Jakes & Nell, in Meadow Lane, where he investigated fixed air (carbon dioxide) from the fermenting wort.

During 1772 Priestley announced the discovery of nitrous air (nitric oxide) and marine acid air (hydrochloric acid), and there was also his important discovery that water soluble gases could be collected over mercury.

However, in 1774 he left Leeds for the post of librarian — companion to Lord Shelbourne, living at Calne, near Bowood, Wilts. or at Shelbourne's town house in London. During that year he isolated "dephlogisticated air" (oxygen) by concentrating the solar rays on mercuric oxide (mercury calx, red oxide of mercury). He found the gas was insoluble in water and greatly enhanced the burning of a candle flame. Shortly after he visited Paris with Lord Shelbourne and there met Lavoisier and told him of the new air he had discovered and thus a new era in chemical thought was begun.

Priestley gave up his librarianship in May 1780 and later settled in Birmingham. There he accepted a ministry at New Meeting House, Birmingham, where he taught, preached and helped to organise one of the first Sunday schools in England. In 1782 he published his "History of the Corruptions of Christianity" followed by eleven volumes of religious history, seven volumes of sermons, tracts and catechisms. His output on political and legal matters was also voluminous.

Regrettably Priestley's religious views and his political support for the French Revolution rebounded on him when in 1791 a local mob rioted and marched to his house and set fire to it destroying his library and laboratory. Later he made his way to London where he took up office for a while preaching at the Gravel Pit Chapel, Hackney. Three years later in 1794 he sailed for America and settled in Northumberland, Pennsylvania. In that year Lavoisier was sent to the guillotine. Priestley died on February 6, 1804.

*A short paper given at the Spring Conference, University of Warwick, April 1982.

Those who knew Priestley personally admired him immensely, apparently accepting or putting up with his extreme religious views realising his integrity. Historians see him as outstanding in philosophy, politics, and theology and his fantastic contributions to chemistry are unique in that he was not a trained chemist. However he could not have achieved his success without help. He received gifts of cash and kind from many friends and admirers — one of those was Josiah Wedgwood.

Josiah Wedgwood was born three years before Priestley in 1730. He was the 13th and youngest child of Thomas and Mary Wedgwood, of the Churchyard Pottery. His mother, Mary, was the daughter of a Mr. Stringer, Unitarian minister of Newcastle under Lyne.

Although there are doubts about the date of the first meeting of Wedgwood and Priestley there is no doubt that Wedgwood had read many of Priestley's papers. Josiah Wedgwood had been interested in chemistry — or rather ceramic chemistry since 1754 — looking all the time for new clays, new glazes, and enamels to improve his wares. He sought the assistance of all his friends when he wanted specimens of earth, clays, rocks or minerals.

Josiah kept details of his experiments and trials in an Experiment Book in which he recorded nearly 5,000 trials during 35 years.

In 1782 he submitted a paper to the Royal Society entitled "An attempt to make a thermometer for measuring the higher Degrees of Heat from a Red Heat up to the Strongest that Vessels can Support". Later in January 1783 Wedgwood was made a Fellow of the Royal Society and he published other papers on his thermometer all of which brought him into contact with many other scientists, including Lavoisier.

Experimental chemistry was undoubtedly one of Wedgwood's strong features and thus we have both Priestley and Wedgwood neither originally trained as chemists but both becoming supreme in that technology.

Wedgwood had noted that in some of Priestley's experiments the results were uncertain because the glass tubes melted or the gun barrel "furnished phlogiston". Wedgwood decided therefore to make tubes of a kind of crucible composition which led to the production of retorts, evaporating baths and other vessels for the laboratory. Eliza Meteyard states that some of these had been provided by Wedgwood to Priestley before he left Leeds in 1773, but that apparently has not been confirmed. What is known is that Wedgwood made a note during his reading of volume 3 of Priestley's *Experiments and Observations on different kinds of Air*, published in 1777 — "The Dr. seems much at a loss for a mortar, not metal for pounding in. Make him a deep one or two." Probably the earliest record of that truly pharmaceutical item — the composition mortar. On May 30, 1779 Wedgwood wrote to Bentley that he was carrying out trials of mortar material. "They came out of the kiln more vitreous indeed but blistered, notwithstanding they still imbibe a little oil". He went on to say he was trying a new formula.

Apparently the problem was solved for a few weeks later on 3rd July there is another letter suggesting that Samuel More should have a mortar proved at the Apothecaries Hall and "leave it to be seen". "If we could contrive to get a character for them from the Hall it would be of great value".

The Wedgwood & Bentley catalogue 1779 announced the availability of the mortars and an advertising leaflet for Wedgwood & Bentley mortars appeared in 1779 or 1780.

Earlier Wedgwood had been willing to supply retorts, crucibles, evaporating pans and pestles and mortars free to his scientific friends in the cause of research. Soon, however, the demand became so great it was necessary to fix a proper price for them. However, Priestley was still being supplied without charge in 1787.

It has been suggested that it was Priestley's request that caused Wedgwood to make a pestle and mortar in his new biscuit material — somehow I doubt that. I am sure he was well aware of the "market" and was an astute business man.

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As an aside I might add that Silvanus Bevan (1691-1765) the London Apothecary who founded Allen & Hanbury became an F.R.S. in 1724 and in the following year took on William Cookworthy as an apprentice. (Cookworthy later discovered the Cornish mineral deposits which enabled him to be the first, in this country, to make hard paste porcelain). Bevan was a competent carver of ivory and a number of his relief portraits were sent to Josiah Wedgwood by Samuel More in 1778 and used for jasper portrait medallions. The portraits are said to be "crude but lively".

I must acknowledge the help I have received from the Library and staff of the Pharmaceutical Society and also the Wedgwood Museum staff. Since the Spring Conference my attention has been drawn to the very detailed study by Dr. J.A. Chaldecott "Wedgwood's ceramic wares for chemical use" Ambix Vol 2 pt 3 pp 184-205 (1981).

Some Masters of the Worshipful Society of Apothecaries

By T. D. WHITTET

The post of Master of the Worshipful Society of Apothecaries of London has existed since 1617 when the apothecaries were granted independence from the Grocer's Company by the Royal Charter of James VI and I.

Even before then apothecaries had held high office in the Grocers' Company and its predecessors the Fraternity of St. Anthony (1345-1373) and The Pepperers' Gild (1180-1345). For example, Sir John de Grantham, Mayor of London, 1329 and a Member of Parliament, 1327,28 was a Warden of the Pepperers, as were several members of the Fraternity.

Several apothecaries had been Master of the Grocers' Company e.g. William Burton, apothecary to Kings Henry IV and V (1404), John Ryche, (1580) and Hugh Morgan (1584) both apothecaries to Queen Elizabeth I.

Gideon de Laune, apothecary to Anne of Denmark, wife of James, is reputed to have persuaded the King to grant the Charter. As he was a Huguenot he was unable to become Master until he was granted the Freedom of the City of London in 1628 by an order of the King to the Lord Mayor. He did not become a British subject until 1635. He was Master in 1628-29 and again in 1637-38.

The first Master was Edmond Phillips who served from 1617 until 1621, was a member of the committee which produced the first London Pharmacopoeia in 1618 and was appointed by the King to serve on a committee to garble tobacco. He was elected Sheriff of London in 1634 but paid a fine to be excused from the office. In 1604 he accompanied Dr. Atkins to attend Price Charles (later Charles I).

At least a dozen other royal apothecaries became Master. The very beautiful coloured and inscribed Royal Warrant appointing John and James Chase as apothecaries to Charles II hangs in the Apothecaries Hall. John was Master during the Great Plague of 1664-66 and James in 1688-89. The later was Member of Parliament for Great Marlow (1698-1713). Their father Stephen, an original member of the Scoiety, was a Royal Apothecary and a member of the Court of Assistants. A near relation John II was Master in 1753/54 and remained a member of the Court until his death in 1767. Thus the family held high office in the Society for over 150 years.

Another remarkable person, William Rosewell, was a Lieutenant-Colonel in the Royalist Army during the Civil War, apothecary to Charles II and his Queen and to St. Thomas' Hospital. He was Master in 1661-62.

James St. Amand (Master 1687-88) was apothecary to James II, an Alderman and M.P. for St. Ives 1685/87.

John Nussey, apothecary to George IV, William IV and to Queen Victoria, was Master in 1833/34.

Numerous apothecaries served the City as Aldermen and Sheriffs but only one as Lord Mayor. Sir Thomas Boor Crosby was Master in 1911-12, the year of his Mayoralty, Arthur Long acting as his Deputy Master.

Fellows of the Royal Society

Six Masters were Fellows of the Royal Society. The first was John Chandler (1767-68) who published a treatise on the common cold in 1779. Josiah Colebrook (1774-75) was an antiquarian and naturalist. He was hon. treasurer of the Society of Antiquarians and of the Royal Society Club of which he was the mainstay for many years.

Timothy Lane (1801-02) was keenly interested in the accuracy of glass measures for use in pharmacy and chemistry and he invented and patented the graduated glass measure. He also experimented on rusting and on electrolysis.

William Thomas Brande (1851-52) was a man of many parts. He was Superintending Operator of the Society's laboratory (1812-66), and was Professor of Chemistry and Materia Medica for many years. He also became Professor of Chemistry to the Royal Institution and Assay Master of the Royal Mint. He was an original Fellow of the Chemical Society and its President (1847-49). He was also a Fellow of the Royal Society of Edinburgh and an Honorary Founder Member of the Pharmaceutical Society.

Nathaniel Bagshaw Ward (1854-55) was a distinguished botanist who invented the Wardian Case whereby tea plants were taken from China to India and Ceylon (Sri Lanka) to start the tea-growing industries there. Similarly cinchona plants were taken from South America to the Dutch East Indies (Indonesia) and rubber plants from South America to Malaysia.

Sir Charles Dodds (1947-48) the celebrated biochemist who discovered stilboestrol and numerous biochemical tests also became President of the Royal College of Physicians.

Hospital Apothecary Masters

Several apothecaries of St. Bartholomew's Hospital became Master e.g. Richard Glover (1645-46), Thomas Northey (1752-53). Thomas Wheeler (1823-24), was a distinguished botanist who was demonstrator of plants at the Physic Garden was also Professor of Botany to the Society and Apothecary to Christ's Hospital. He had six sons, all of whom became apothecaries and two became Masters — Charles West Wheeler (1862-63), also apothecary to St. Bartholomew's and James Lowe Wheeler (1867-68). At least six generations of that family were in the Society.

Two apothecaries of the Bethlem Hospital became Master - James James (1655-56) who remained at his post during the Great Plague and William Elderton (1750-51).

The roll of Masters includes many other interesting characters such as two apothecaries to Samuel Pepys, both of whom are mentioned in his diary. These were Walter Pelling (1671-72) and John Battersby (1674-75). The mortar of the latter, bearing his name and the date 1666 is in the Apothecaries Hall.

Among recent Masters have been Lord Porrit, Olympic athlete, famous Royal Surgeon who served as President of the Royal College of Surgeons, the Royal Society of Medicine and the British Medical Association and as Governor-General of New Zealand; Lord Richardson, former President of the General Medical Council and of the Royal Society of Medicine; Sir Brian Windeyer, former Vice-Chancellor of London University; Sir Ronald Bodley Scott, physician to Her Majesty the Queen; Dr. Elston Grey-Turner, former Secretary of the British Medical Association; Sir Gordon Wolstenholme, first Director of the CIBA Foundation and former President of the Royal Society of Medicine and the immediate Past-Master, Sir Ronald Gibson, former Chairman of the British Medical Association Council and of the Central Medical Advisory Committee.

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Congratulations

The Society of Apothecaries of London has elected Dr. T.D. Whittet as Master of the Society. He is the first pharmaceutical master since the Apothecaries Act of 1815 transformed the Society from a pharmaceutical to a medical one. Dr. Whittet has also been re-elected as President of the History of Medicine Section of the Royal Society of Medicine for 1882/83.

International Congress

The biennial Congress of the International Society for The History of Pharmacy is being organised by the American Institute for the History of Pharmacy and will be held at the Capital Hilton Hotel, 16th & K Streets, N.W., Washington, DC 20036, U.S.A. Details are available from the Secretary General, 1983 International Congress for the History of Pharmacy, 2215 Constitution Avenue, N.W. Washington DC 20037, U.S.A.

New Books

A recent publication by the Science Museum Library, South Kensington, London SW7 5NH is "*Reference Books for the Historian of Science*" £2.50 (£3.00 by post) compiled by S.A. Jayawardene. It is a bibliography of some one thousand titles, including general reference works.

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